"A study to assess the effectiveness of dry heat versus moist heat application on episiotomy wound healing and pain perception among postnatal mothers in tertiary care hospitals of Bhopal"

Dissertation

Submitted to the Faculty of Nursing

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, BHOPAL

In partial fulfilment of the requirement for the degree of M.Sc. in Obstetrics and Gynecological Nursing

By

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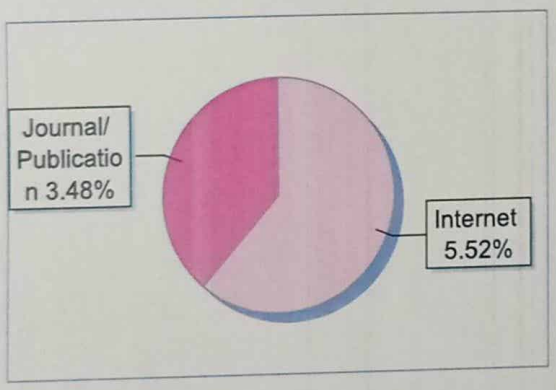

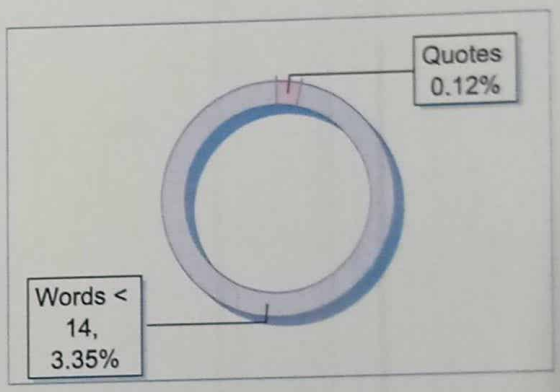

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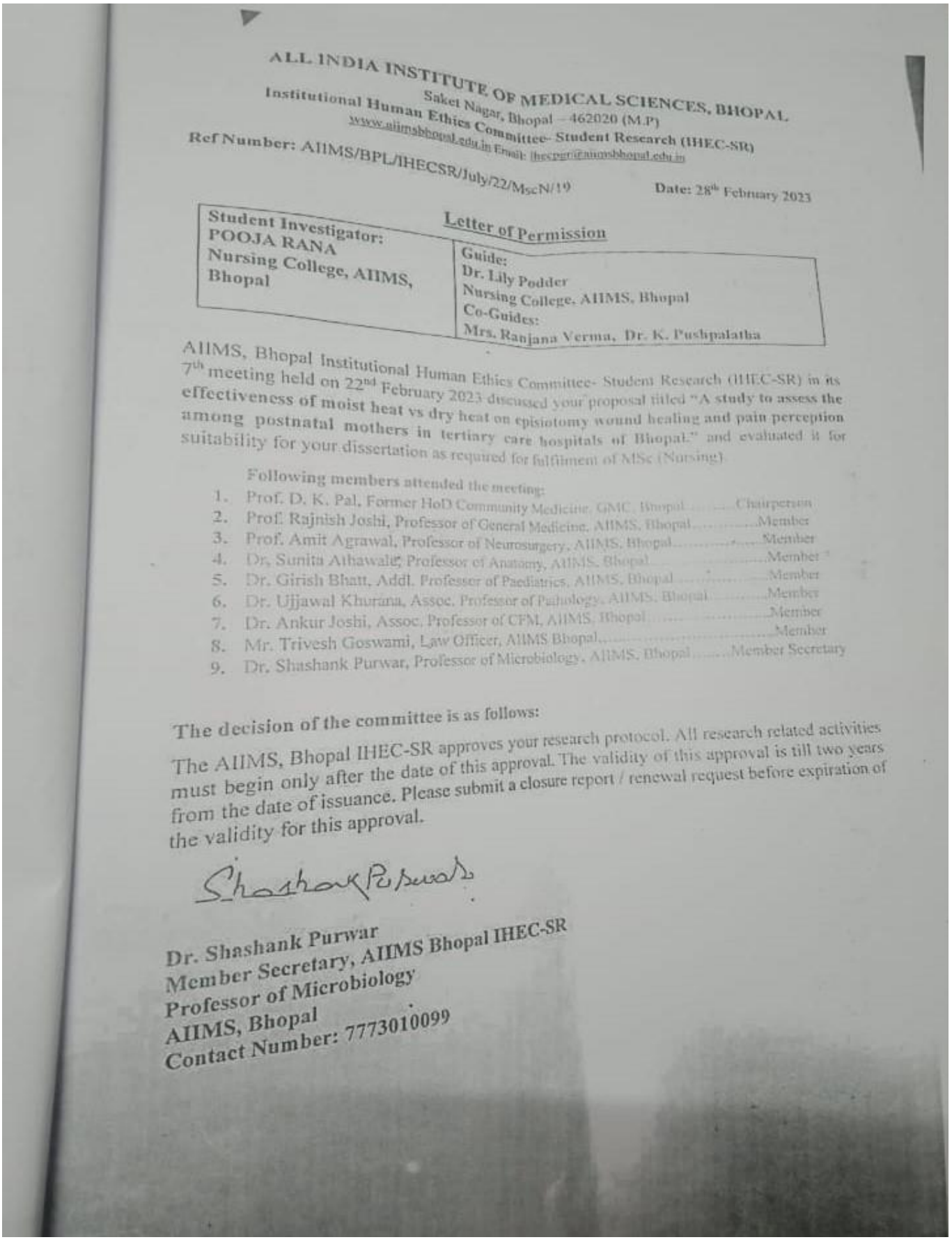

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Following members attended the meeting:

1. Prof. D. K. Pal, Former HoD Community Medicine, GMC, Bhopal.....Chairperson
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The decision of the committee is as follows:

The AIIMS, Bhopal IHEC-SR approves your research protocol. All research related activities must begin only after the date of this approval. The validity of this approval is till two years from the date of issuance. Please submit a closure report / renewal request before expiration of the validity for this approval.

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"*Appreciation is the highest form of prayer , for it acknowledges the presence of goodwherever you shine the light of thankful thoughts."*

Alan Cohen

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With great thanks-

Pooja Rana

ABSTRACT

Title of the study: A study to assess the effectiveness of moist heat vs dry heat on episiotomy wound healing and pain perception among postnatal mothers in tertiary care hospitals of Bhopal.

Introduction :

Childbirth is a process which is beautifully designed by nature and a joyous event for the women, family and caregivers. But the mother may suffer distress after childbirth due to episiotomy wound and pain associated with it. Episiotomy is used to widen vaginal orifice during the second stage of labor to facilitate difficult deliveries. There is high prevalence of episiotomy during labor process accounting to 93.3%in primipara women and 30.2% in multipara women. Infection of episiotomy wound can lead to puerperal sepsis which is one of the major causes of maternal morbidity and mortality. Many interventions arefound to aid the healing process and relieve perineal pain resulting from episiotomy such as cleanliness, application of ice pack, dry heat (Infra -Red Therapy), moist heat (sitz bath), Kegel exercise and perineal care. Therefore, the present study was undertaken aimed to assess the effectiveness of moist heat vs dry heat application on episiotomy wound healing and pain perception among postnatal mothers.

Methods : A quasi - experimental study was carried out at the postnatal ward of a tertiary care hospital of Bhopal (All India Institute of Medical Sciences, Bhopal) from October to November 2023.A total of 60 postnatal mothers following 12 hours of vaginal delivery were selected through non-probability convenient sampling technique and allocated into dry heat group(n=30) and moist heat group (n=30). Dry heat (Infra-red lamp therapy) and moist heat (Warm compression) was provided for 20 minutes twice a day for 3 days with the gap of 8 to 10 hours in between the two interventions. Effectiveness of the interventions were measured

in terms of pain perception and wound healing after 3 days of intervention using Visual analogue scale (VAS) & modified REEDA (Redness, Ecchymosis, Edema, Discharge, Approximation) scale.

Result : Both the groups were homogenous in terms of sociodemographic and clinicalvariables ($p>0.05$). Both the interventions were found to be significantly effective, but dry heat was more effective than the moist heat in reducing the pain perception($P<0.05$) and improving the wound healing ($P <0.05$) among the postnatal mothers.

Conclusion – When it comes to decreasing pain perception, dry heat works better than moist heat for postnatal mothers who have an episiotomy. Dry heat has a long-lasting effect that keeps the wound dry and lessens pain perception. Because infrared treatment has a critical role in enhancing quality of life during the post-partum period, the study advocated to include it as a primary component of post-partum instructions for the women**.**

Trial registration no: -CTRI/2023/10/058227

Key words- Dry heat, Moist heat, Episiotomy ,Wound healing, Pain perception, Postnatal mothers, Effectiveness

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LIST OF ABBREVIATION

Abbreviation	Expansion
WHO	World health organization
ANOVA	Analysis of variance
IRR	Infra red radiation
BPT	Birth Perineal Trauma
HRRCs	Human Reproduction Research Centers
DF	Degrees of Freedom
RBC	Relationship-Based Care
LMIC	Low - and middle-income countries
0ASIS	Obstetric anal sphincter injury
N	Total Number of Sample
NS	Not Significant
VE	Vaccum extraction.
P	Probability (Level of Significance)
SD	Standard Deviation
RCTs	Randomized control trails
VAS	Visual Analogue Scale
PPI	Present pain intensity.
USA	United States of America.
REEDA	Redness, Edema, Ecchymosis, Discharge,Approximation

“

CHAPTER I

INTRODUCTION

INTRODUCTION

A new baby is like the beginning of all things-wonder,hope,a dream of possibilities

-Eda J LeShan

Background of the study

Giving birth is a significant and transformative experience that affects women and their families for the rest of their lives. The puerperium, which follows the baby's birth and placenta removal, is the time when the mother recovers physically and mentally. [1] A postnatal mother is adjusting to her new role in the family and going through the physiological process of uterine involution during this time. [2] The postnatal mothers are particularly vulnerable during the puerperium as they are thought to be normal, however they may feel some discomfort. This discomfort, which include backache, headaches, exhaustion, cracked nipples, constipation, breast engorgement, and after soreness, can cause mothers' quality of life to decline as well as physical and psychological discomfort and a poor quality of life for the mothers. [3] They may experience pain universally during the puerperium. It could be the result of an episiotomy, an unplanned tear, or both. A significant issue that arises throughout puberty is pain and wounds from episiotomies.[4]

One of the most frequent surgical operations carried out during the second stage of labor is an episiotomy. The procedure aims to protect the fetal skull and brain from harm, reduce overstretching and perineal muscle rupture, lengthen the vaginal opening to enable a simple and safe delivery of the fetus, and shorten the pushing time, which lowers the risk of oxygen deprivation in the fetus. [5]Under a local anesthetic, an

episiotomy can be performed along the midline or at an angle from the posterior end of the vulva. It is sutured right away after birth. [6] There are four different types of episiotomies: J-shaped, lateral, middle, and mediolateral. The most common type that is utilized frequently is mediolateral episiotomy. Every kind of episiotomy has benefits and drawbacks. [7.]

The incidence of episiotomy varied from 20% to 62.5% globally. There are differences between countries in the prevalence of episiotomy in primiparous women.[8]The rate of episiotomies was 9.7% in Sweden compared to 100% in Taiwan; in Germany, it was 71%, in Nigeria, it was 49%, and in India, it was 56% of women. [(9, 10)] The rate of episiotomies in Norway was 22.7%, whereas in Guatemala the rate was 100%.[9]. Furthermore, 51.2% of Saudi Arabia's episiotomies were performed in Arab nations. [12], 66% in Jordan [14], 91% in Oman [13.]

Additionally, a Palestinian study found that six of the eight government hospitals routinely perform episiotomies on primiparous women during childbirth [15]. According to data from Egypt's Benha University Hospital's Statistical Department, 94% of vaginal births in 2015 had an episiotomy, compared to 93% in 2016. [16]

Significant complications from an episiotomy include discomfort, hemorrhage, edema, infection, and in the end, dyspareunia from a sensitive vaginal scar or vaginal constriction. [17] All of these issues can be resolved through right medical care. Using the optimal treatment for an episiotomy as soon as feasible will guarantee full healing of the wound with few complications and the fastest recovery period. Therefore, midwives role is crucial in the management of postpartum perineal lesions. The requirement to encourage wound healing must be balanced with the maintenance of efficient pain alleviation. [(18, 19)]An additional worry for the postnatal mothers in an already stressful circumstance is the discomfort associated with episiotomy. Perineal pain may last longer

if wound healing is delayed. Episiotomy-related pain and discomfort can hinder a woman's ability to perform simple everyday tasks like sitting, walking, and urinating, as well as mother-infant connection, breastfeeding, reestablishing a bond with her spouse, and even her emotional recovery after giving birth. [20, 21] During the postnatal period, when the mother and baby need to be attended to by a nurse midwife continuously, the nurse-midwife should assess the comfort and healing of the perineum wound site. [18]

In addition to increased blood loss during birth, mothers who undergo episiotomy run the risk of experiencing delayed wound healing and pain in the early puerperium. An episiotomy heals similarly to any other surgical incision. Healing should happen two to three weeks after giving birth. [19] Pain and a delay in wound healing are caused by an infection of the episiotomy wound incision. Infection symptoms can include discomfort, redness, warmth, swelling, drainage, or loss of approximation. Wound redness could be a sign of the typical inflammatory reaction to an injury. However, if it is accompanied by severe pain or soreness, it can be the start of a localized infection. Edema or ecchymosis are signs of soft tissue injury that can impede healing. The wound shouldn't leak anything. It is necessary to approach the wound edges closely in order to promote rapid healing. [22]It is possible to avoid infection and hasten recovery with appropriate episiotomy care. [14]

After birth, episiotomy treatment would start right away and would involve both pain management and local wound care. The care of episiotomy is different from hospital to hospital.. Numerous strategies are used to reduce discomfort and speed up the healing of episiotomy wound. Pain and wound care related to episiotomy during puerperium may be managed using pharmaceutical or non-pharmacological methods. Pharmacological methods include non-steroidal anti-inflammatory drugs, antibiotics, oral analgesics, local anesthetics, and opioids. These techniques help with pain management and wound

healing to some extent, but they can also have negative effects on the mother and fetus, including constipation, upset stomach, drug transfer to the breast milk, and extended bleeding. Non-pharmacological methods include cleanliness, application of ice packs, and performing Kegel's exercises, infrared lamp therapy ,warm compression and warm sitz bath application. [3, 5, 23]

A common issue for many postpartum women is persistent perineal discomfort resulting from an episiotomy wound. Warm sitz baths and infrared light therapy are used to treat perineal pain and determine the wound's long-term effects. Using the light's therapeutic properties, infrared lamp therapy is a novel approach in treating episiotomy. This therapy relieves discomfort by subjecting the incision site or the affected area of the perineum to infrared radiation for 10 to 15 minutes at a distance of 45 to 50 cm from the source of light. It is extremely easy to use, painless, and has no negative effects. [24] Infrared radiation relieves pain, increases circulation, lessens edema, and relaxes muscles. An enough blood flow is necessary for wound healing, infection prevention, and bacterial destruction. By using infrared light, blood vessel vasodilatation and increased fluid exchange will occur, lowering the degree of edema. Sitz bath is one of the techniques that can be improved episiotomy wound healing. [24]Warm water baths, or sitz baths, entail submerging the buttocks and perineal area in 40 to 45 degree Celsius water for 15 to 20 minutes. It can be applied to promote wound healing and reduce aches, pains, and spasms in the muscles. By cleansing the anus and perineum, boosting circulation, lowering edema and inflammation, and encouraging muscular relaxation, sitz baths may help wounds heal more quickly. [25]

Providing clients cost-effective care is the main goal of medical treatment in the present day and age when the expense of medical care and treatment is growing. If nurses and midwives understand the importance of their care in the healing of the episiotomy

wound, then cost-effective therapies can be given. Giving nurses and other healthcare professionals the freedom to make changes to their routines is the greatest approach to offer care. [26]

It is critical that midwives understand the value of using evidence-based practices. It is the midwife's duty to determine the most economical methods for pain relief and wound healing in addition to techniques that prevent and minimize maternal morbidity. [27] The overall management of perineal pain and wound healing following an episiotomy is greatly aided by the work of nurses and midwives, who also apply interventions for the wound, teach women self-assessment and care techniques for the perineum and disseminate pertinent information about the pain and healing process. [28]

Need for the study

For mothers, the postpartum period is a beautiful and joyful time, but it is also difficult and filled with a lot of stressful events. [29] During the postpartum phase, a number of health issues may surface. If they are not addressed quickly and successfully, they may result in poor health and even death for the mother, her newborn, or both [30.] During the postnatal period, the most common discomfort that arises is perineal soreness. After a spontaneous birth, it affects 42% of women and lasts for more than three months. After an episiotomy, spontaneous tears, or an instrumental delivery, perineal pain gets worse [31].A planned surgical incision to the perineum, performed either right before delivery or during the second stage of labor, is called an episiotomy or perineotomy which is done to expand the vaginal orifice. [32]

Due to disparities in attitudes and training, the occurrence of episiotomy varies geographically between nations and institutions worldwide. High episiotomy rates continue to be recorded in numerous nations as of right now. [34.] In Egypt, 94% of vaginal births in 2015 and 93% of vaginal births in 2016 had an episiotomy, according to the Statistical Department of the postnatal inpatient ward and the outpatient clinic of the El-Shatby Maternity University Hospital [27]. Thirty to fifty percent of women still get episiotomies, even though the World Health Organization advises reducing the procedure's frequency to ten percent for vaginal births. [28]. For women who have just given birth, episiotomy is linked to clinically significant morbidities such as perineal injuries, the requirement for suturing and healing complications. [35]

Mother's physical, psychological, and social well-being can be impacted by episiotomy-related morbidity in the short- and long-term postnatal period [36.] Following a perineal episiotomy, women may experience a number of consequences, including bleeding, infection, harm to the mucosa and anal sphincter, wound dehiscence, dyspareunia, decreased libido, perineal pain, and anal and urine incontinence. There have been reports of episiotomy-related perineal pain and discomfort interfering mother's everyday activities, including sitting, walking, and lifting the newborn. It can also interfere with rooming in, appropriate nursing, and mother-infant bonding .[37]

Mothers must balance their recuperation during the delicate postpartum period with attending to their newborns' demands. One important component of postpartum treatment that can have a favorable impact on mother's lives is effective episiotomy management. [38.] There exist multiple therapies aimed at mitigating perineal discomfort, fostering healing, and diminishing perineal edema, redness, and pain. Keeping the wound dry, practicing perineal cleanliness, and utilizing a range of pharmacological and nonpharmacological therapies are some of these measures. [39]

Maternity nurses need to be knowledgeable about effective episiotomy wound care, as it helps lessen postpartum mother's pain and promotes wound healing. Numerous non-pharmacological interventions, such as acupuncture, cryotherapy, laser treatment, electrical stimulation, Kegel's exercise, dry heat (infrared therapy), and moist heat applications (sitz bath) support the healing process [40]

One method to improve wound healing and relieve perineal pain is to apply moist heat. It is done by submerging the mother's buttocks and perineal region in warm, 110°–115°F water for 15–20 minutes. It can be applied to reduce muscular spasms, itching, and discomfort in the perineum [34]. By soaking the anus and perineum, enhancing circulation, reducing swelling and inflammation, and encouraging muscular relaxation, moist heat can help speed up the healing of wounds [41] According to gate control theory, heat appears to activate heat receptors in the skin and deeper tissues, which may lessen pain. [42]

Conversely, dry heat therapy with an infrared lamp is a unique kind of treatment that uses light's healing properties to treat episiotomy. The incision site or the affected area of the perineum is exposed to infrared radiation using a 230-volt light source for ten to fifteen minutes, at a distance of 45 to 50 cm. [43]A beneficial consequence of infrared radiation is that it aggregates the blood supply and relieves pain. This will improve the amount of nutrients and oxygen that are available to the tissues, hasten the elimination of waste, and aid in the reduction of inflammation. The calming impact of dry heat on the superficial sensory organs is most likely the cause of pain alleviation. It also aids to accomplish muscular relaxation and for the release of muscle spasm associated with injury or inflammation.[44]

For patients with episiotomy injuries, infrared therapy is a suitable alternative intervention. It may have a direct impact on blood vessels in addition to its biological effects on cutaneous vasodilation through the release of chemical vasodilators, histamine, and similar ingredients. (46.47)

Comforting the mother, assisting with pain relief, and preventing infection should be among the top priorities for medical professionals throughout the postpartum period. Enhancing the healing of the episiotomy wound is therefore one of the main issues following a typical birth. The nurse bears the primary duty of identifying mothers who have undergone episiotomy and providing them with the necessary and efficient educational care. Their primary duty is to provide women with care and health attention during their pregnancy, labor, and postpartum period. They also have a responsibility to improve the outcomes for mothers and newborns by preventing and reducing problems that arise during or after labor. [48]

This field encompasses a wide range of practices. Nurses and midwives, however, need to understand the importance of their care as well as the potential positive and negative effects of recommended treatment on wound healing. Therefore, it becomes their duty to determine how to avoid and reduce maternal morbidity as well as how low-cost pain relief strategies work. [49]

Numerous studies have been conducted in this area, but the findings are conflicting when it comes to the best ways to reduce episiotomy discomfort and speed up wound healing. [50] As the researcher observed the practice of warm compression in the postnatal wards and understood its importance in episiotomy wound healing and pain, the researcher felt the need for more studies to be conducted in this respect. Therefore, this study was conducted to compare the effect of dry heat (infrared lamp therapy) versus moist heat (warm compression) on episiotomy wound healing and pain perception

among postnatal mothers.

Fig 1: Relationship-Based Care model

Relationship-Based Care (RBC) is an overarching philosophy that focuses on three relationships for the provision of humane and compassionate care – the midwife's relationship with patients and families, colleagues, and self, engendering a culture of patient and family centered care. Midwife supports the values, rights, and beliefs of the patients and families, to excellence in patient care. [51]

- ❖ RBC is a culture of caring where the patient and family are the central focus.
- ❖ The midwife and other team members of the health care team strive to understand what is most important to the individual patient, and actively engage them in all aspects of care.

- ❖ It is a culture that supports healing and caring.

Based on the above care model, the midwife/ investigator is interested in ensuring the professional nursing practice by investigating the study among postnatal mothers with episiotomy in reducing the pain perception and improving the wound healing status by administering Dry heat and Moist heat.

RESEARCH PROBLEM STATEMENT

A study to assess the effectiveness of dry heat versus moist heat application on episiotomy wound healing and pain perception among postnatal mothers in tertiary care hospitals of Bhopal.

RESEARCH QUESTIONS

1.Is dry heat effective in reducing the pain level and improving the wound healing status of postnatal mothers?

2.Is moist heat effective in reducing the pain level and improving the wound healing status of postnatal mothers?

AIM

The aim of the study is to compare the effectiveness of dry heat versus moist heat on episiotomy wound healing and pain perception among postnatal mothers.

OBJECTIVES

- To assess the pre-interventional and post-interventional episiotomy wound healing and pain perception among postnatal mothers in dry heat and moist heat group.
- To compare the effectiveness of dry heat versus moist heat on episiotomy wound healing and pain perception among postnatal mothers.
- To associate the post- test level of episiotomy wound healing and pain perception among postnatal mothers in dry heat and moist heat group with their selected demographic variables.

HYPOTHESES

H0:There is no significant difference in the effect of dry heat and moist heat on episiotomy wound healing and pain perception among postnatal mothers at 0.05 level of significance.

H1:There is a significant difference in the effect of dry heat and moist heat on episiotomy wound healing and pain perception among postnatal mothers at 0.05 level of significance.

OPERATIONAL DEFINITIONS

Effectiveness

In this study, effectiveness refers to the outcome of the dry heat and moist heat on episiotomy wound healing and pain perception among postnatal mothers. It is measured in terms of the difference between the post- test and pre- test pain scores measured using the Visual Analogue Scale (VAS)and episiotomy wound healing measured using the REEDA scale.

Dry heat

In this study, dry heat refers to the application of infrared heat produced by the infra-red lamp which was placed at 50cm (20 inches) distance from the perineum and the heat produced with 230 volts was allowed to remain for 20 minutes two times per day for

three days.

Moist heat

In this study, moist heat refers to application of warm compression using a clean cotton cloth of 10x10 cm dimension and 1cm thick soaked in warm water with a temperature of 140-160°F (60-71°C) and applied and compressed on the episiotomy wound for 20 minutes two times per day for three days.

Postnatal Mothers

In this study it refers to mothers who delivered their babies by vaginal delivery with episiotomy immediately twelve hours after delivery.

Episiotomy pain perception

In this study ,it refers to an unpleasant sensory and emotional experience arising from actual or potential tissue damage because of episiotomy as experienced by the postnatal mothers. The pain perception will be assessed by Modified Visual Analogue Scale (VAS).

Episiotomy wound healing

In this study ,it refers to the process of healing of a surgically planned incision on the perineum and the posterior vaginal wall during the second stage of labor characterized by redness, edema, ecchymosis, and discharge around the wound. The wound healing status was measuredby REEDA scale.

DELIMITATIONS

1) The study was delimited to postnatal mothers with episiotomy wound who were admitted in tertiary care hospitals of Bhopal .
2) The study was delimited to a sample of 60 postnatal mothers with episiotomy wound.
3) The study was delimited to a period of four weeks.

PROJECTED OUTCOME

- The study will help to improve the healing of episiotomy wound and reduce the pain level among postnatal mothers.
- The study will help to prevent postnatal infections.

CONCEPTUAL FRAMEWORK

A conceptual frame work is a group of concepts and a set of prepositions that spell out the relationship between them. The overall purpose is to make scientific findings meaningful and generalizable . Concepts are the building blocks of the theory. [52]

Polit and Hungler states that conceptual framework is inter related concepts or abstractions that are assembled together in some rationale scheme by virtue relevance to a common thing, the device that helps to stimulate researchand the extension of the knowledge by providing both direction and impetus.

It‘s a frame work which provides the investigator the guidelines to proceed in attaining the objectives of the study based on theory. It is a scientific representation of the steps, activities and outcome of the study.

The present study was aimed to assess the effectiveness of dry heat vs moist heat application on episiotomy wound healing and pain perception among post natal mothers with episiotomy.

The conceptual frame work of the present study is based on Ernestine Wiedenbach's helping art of clinical nursing theory (Figure1.3),which consists of three steps that is central purpose, prescription and realities.

Wiedenbach proposes a prescriptive theory for nursing which is described as conceiving of a desired situation and the ways to attain it. Prescriptive theory directs action toward an explicit goal. A nurse develops a prescription based on a central purpose and implements it according to the realities of the situation. In the present study Wiedenbach, nursing practice consists of identifying the patient's needed help and validating the provided help. [53]

CENTRAL PURPOSE

It refers to what the nurse (investigator) wants to accomplish. It is the overall goal which acts dynamically in relation to one's belief.

IDENTIFICATION

The present health needs of postnatal mothers is the pain in the episiotomy wound. The nurse investigator identifies the level of episiotomy wound healing and pain perception of postnatal mothers with episiotomy and sets a goal to reduce pain and enhance episiotomy wound healing and comfort of post natal mothers with episiotomy.

PRESCRIPTION

Refers to the plan of activities directed. It specifies the nature of the action that will fulfill the nurse‘s central purpose and the rationale for that action. A prescriptionary indicate the broad general action appropriate for the implementation of the basic concepts and suggest the kind of behavior needed to carry out these actions in accordance with the central purpose. Here the investigator reviews interventions Dry heat(infrared lamp therapy) and Moist heat (warm compression), formulate a plan for administration and develop Visual Analogue Scale (VAS) and REEDA Scale for the assessment of episiotomy wound healing and pain perception.

REALITIES

Refers to the physical, physiologic, emotional and spiritual factors that comes to play in a situation involving nursing actions. The realities are

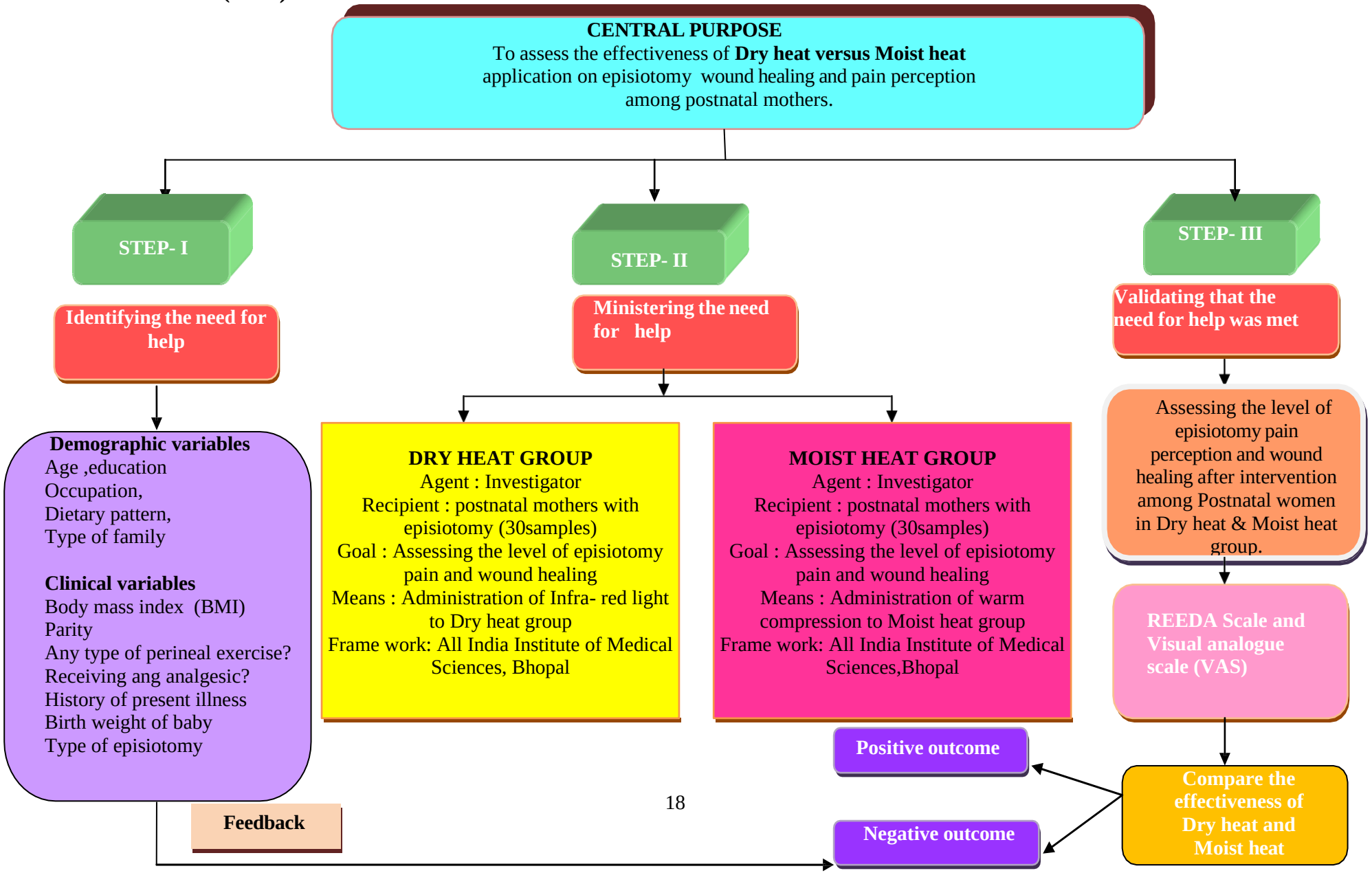
- **Agent –** is the investigator
- **Recipients** – are the postnatal mothers
- **Goal** – to reduce episiotomy pain perception and improve the wound healing status
- **Means** : Infrared lamp therapy and warm compression
- **Frame work**: Tertiary care hospitals of Bhopal, Madhya Pradesh. In this phase the investigator carry out interventions such as Dry heat (Infrared lamp therapy) and Moist heat (warm compression)

Validation: In this phase, the episiotomy wound healing is assessed by using the REEDA scale and the pain perception level by Visual Analogue Scale (VAS) to determine the effectiveness of infrared lamp therapy and warm compression. The wound healing is categorized into no wound healing, mild wound healing, moderate wound healing and severe wound healing. The pain level is categorized in to no pain,

mild pain, moderate pain, and severe pain. These categorizations have been done to find out the extent of effectiveness. Reinforcement is suggested to the subjects with positive outcome, whereas negative outcome is again identified as a need for continuation of treatment (feedback).

Validation: In this phase, the episiotomy wound healing is assessed by using the REEDA scale and the pain perception level by Visual Analogue Scale (VAS) to determine the effectiveness of infrared lamp therapy and warm compression. The wound healing is categorized into no wound healing, mild wound healing, moderate wound healing and severe wound healing. The pain level is categorized in to no pain, mild pain, moderate pain, and severe pain. These categorizations have been done to find out the extent of effectiveness. Reinforcement is suggested to the subjects with positive outcome, whereas negative outcome is again identified as a need for continuation of treatment (feedback).

FIGURE 2: Conceptual Framework to assess the Effectiveness of Dry heat versus Moist heat on Episiotomy Pain perception among Post natal mothers based on Wiedenbach"s Helping Art Model for Clinical Practices (1964) [53]


CENTRAL PURPOSE
To assess the effectiveness of Dry heat versus Moist heat application on episiotomy wound healing and pain perception among postnatal mothers.
STEP- I
STEP- II
STEP- III
Identifying the need for help
Ministering the need for help
Validating that the need for help was met
Demographic variables
Age ,education
Occupation,
Dietary pattern,
Type of family
Clinical variables
Body mass index (BMI)
Parity
Any type of perineal exercise?
Receiving ang analgesic?
History of present illness
Birth weight of baby
Type of episiotomy
DRY HEAT GROUP
Agent : Investigator
Recipient : postnatal mothers with episiotomy (30samples)
Goal : Assessing the level of episiotomy pain and wound healing
Means : Administration of Infra- red light to Dry heat group
Frame work: All India Institute of Medical Sciences, Bhopal
MOIST HEAT GROUP
Agent : Investigator
Recipient : postnatal mothers with episiotomy (30samples)
Goal : Assessing the level of episiotomy pain and wound healing
Means : Administration of warm compression to Moist heat group
Frame work: All India Institute of Medical Sciences,Bhopal
Assessing the level of episiotomy pain perception and wound healing after intervention among Postnatal women in Dry heat & Moist heat group.
REEDA Scale and Visual analogue scale (VAS)
Positive outcome
Negative outcome
Compare the effectiveness of Dry heat and Moist heat
Feedback

SUMMARY

This chapter deals with the statement of the problem, objectives, hypothesis, operational definitions and conceptual frame work.

CHAPTER II

REVIEW OF LITERATURE

REVIEW OF LITERATURE

Review of literature is defined as a critical summary of review on a topic of interest, often prepared to put forward a research problem in context .

The review of literature in the research report is a summary of current knowledge about a particular practice problem and includes what is known and not known about the problem. The literature is reviewed to summarize knowledge for use in practices or to provide a basis for conducting a study.[54]

Search Strategy

The investigator searched the electronic databases including Web of Science, PubMed,Cochrane Library, Google Scholar, Wiley online library, Science direct for the publications on effectiveness of dry heat and moist heat at episiotomy site from the past 10 years.The searches were carried out using MeSH terms combined with Boolean operators inPubMed. The Boolean operators were used as – AND, OR, NOT such as “episiotomy wound healing ”

OR “episiotomy wound healing” AND “pain perception “ AND “postnatal mothers” OR “dry heat “The extensive review of literature was done and the researches include articles with full text, abstracts, free full text, documents, clinicaltrial, meta-analysis, randomized controlled trial, systematic review and protocols. Thekeywords used were – effectiveness, postnatal mothers, dry heat, moist heat, episiotomy wound healing, pain perception

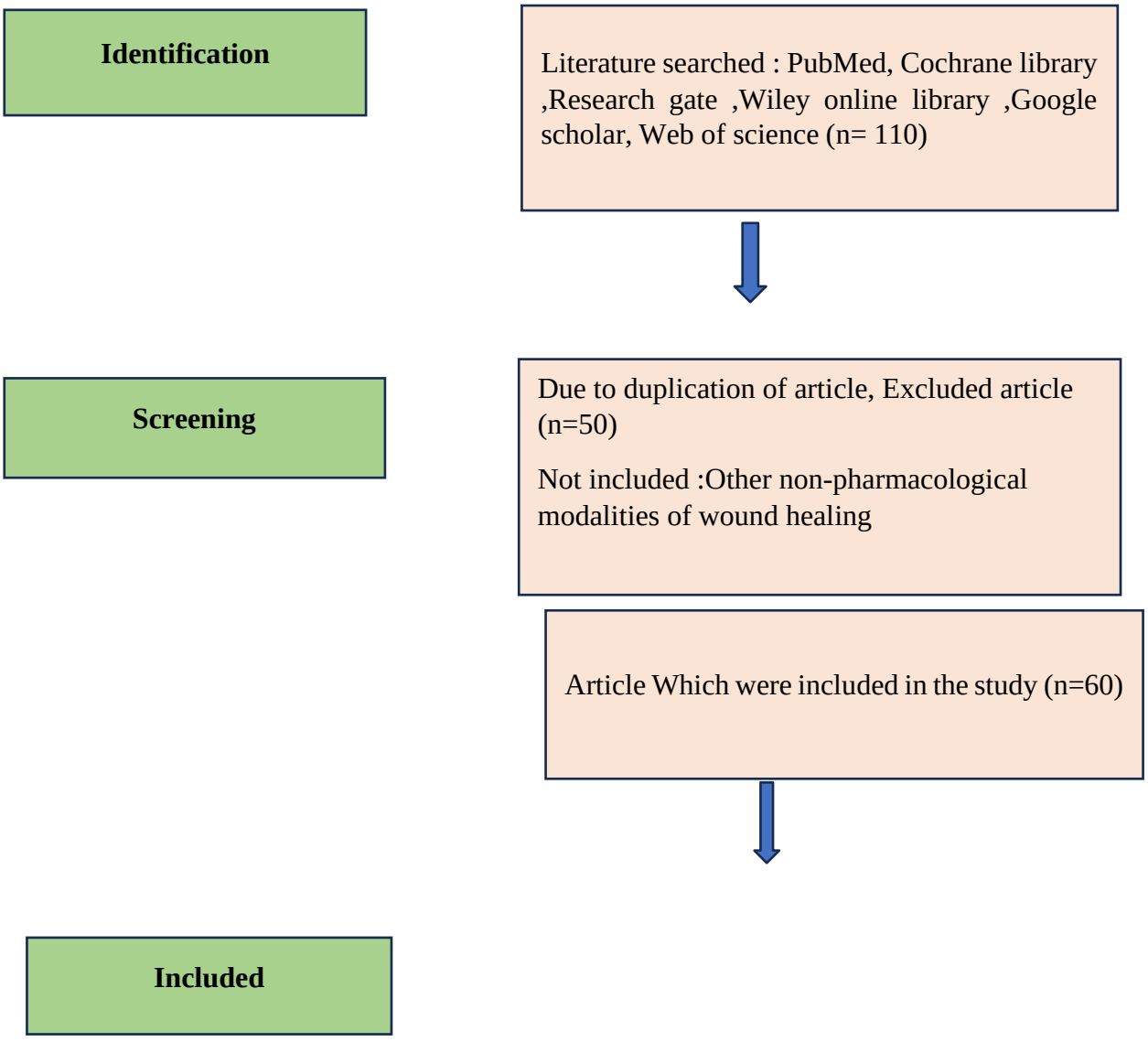

Identification
Literature searched : PubMed, Cochrane library ,Research gate ,Wiley online library ,Google scholar, Web of science (n= 110)
Screening
Due to duplication of article, Excluded article (n=50)
Not included :Other non-pharmacological modalities of wound healing
Article Which were included in the study (n=60)
Included

Figure 3: Schematic representation of search strategy

From the collected review of various associated literature and research studies, topics can be divided as follows;

THIS SECTION CONSISTS OF SIX PARTS

SECTION-A: Review of literature related to prevalence of episiotomy.

SECTION-B: Review of literature related to episiotomy wound healing

SECTION-C: Review of literature related to episiotomy pain perception

SECTION-D: Review of literature related to effectiveness of dry heat application

SECTION-E: Review of literature related to effectiveness of moist heat application

SECTION-F: Review of literature related to comparing the effectiveness between dry heat and moist heat application on episiotomy wound.

SECTION-A: REVIEW OF LITERATURE RELATED TO PREVALENCE OF EPISIOTOMY

A systematic review and meta-analysis was conducted by Magda Aguiar et al, in 2019 aimed at collecting data on rates of birth related perineal trauma in low- and middle-income countries. Two independent reviewers examined cross-sectional data from studies conducted in LMICs about the percentage of vaginal births that resulted in episiotomy, second degree tears, or obstetric anal sphincter injuries (OASI).

The results were arranged according to parity, method of birth, and type of birth-related perineal trauma (BPT) after estimates were meta-analysed using a random effects model. The overall BPT rates in LMICs were 24% (95% CI 17–32%), 46% (95% CI 36–55%).For episiotomies, second-degree tears, and OASI, the rates were 1.4% (95% CI 1.2–1.7%), respectively. The study's conclusions showed that, in low- and middle-

income countries' LMIC medical institutions, episiotomy rates are significantly higher than in high-income settings. [55]

A cross- sectional study was conducted by Khreshen R et al., in 2019 to determine the knowledge , attitudes towards and experience of episiotomy practice among cliniciansworking in public hospitals in Jordan. Three public hospitals in Jordan had their midwives and obstetricians complete a self-administered survey form ,112 (87.5%) physicians replied to the survey. The majority of midwives (79%) and obstetricians (80%) believed that an episiotomy rate of 81% was about correct. According to obstetricians (83.1%) and midwives (75.5%), the most frequent reason for conducting an episiotomy was to lower the risk of third and fourth degree perineal lacerations. Obstetricians reported that the biggest barrier to lowering the rate of episiotomies was a lack of training on preventing perineal tears (78.0%), while midwives reported that the biggest obstacle was a lack of time to wait for the perineum to stretch (56.6%) and difficulty altering the labor ward's customs (52.8%). According to this survey, midwives and obstetricians in Jordan rely on non evidence-based beliefs to guide their practice on performing an episiotomy. [56]

A study was conducted by Serathi M et al in 2019 regarding the role of the episiotomy in modern clinical practice,which concluded that a policy of selective episiotomy is acceptable with evidence-based maternal health improvement in comparison with routine episiotomy. Many years later, a revised version of the Cochrane meta-analysis altered the earlier recommendations, emphasizing that selective episiotomy use could not always be deemed beneficial due to the fact that selective policy is linked to a statistically significant reduction in severe perineal and/or vaginal trauma, while routine episiotomy appears to protect against these complications only following instrumental deliveries. According to the study, selective mediolateral

episiotomy has extra positive impacts in the short and long run without any conclusive evidence of harming the mother or child. [57]

A population-based cohort study was conducted by Kaled Zimmo et al., in 2018 among singleton vaginal births conducted regarding episiotomy practice in six Palestinian hospitals. Women who gave birth vaginally to a singleton (n = 29 165) between March 1, 2015, and March 1, 2016 were taken. The samples were split into two groups: the multiparous group (n=20 057) and the first vaginal delivery group (n=9108), which included primiparous women and women who had given birth vaginally for the first time following one cesarean section. Each group was examined independently. According to the study's findings, the total episiotomy rate was 28.7%: 5.9% for parous women (range 1.0%–9.5%) and 78.8% for women who had their first vaginal delivery (range 56.6%–86.0%). According to the study, primiparity in the first vaginal delivery group (69.9%) and safeguarding the perineum in the parous group (59.5%) were the most frequent reasons for episiotomy. The least frequent symptoms were protracted second stage (1.5%) and fetal discomfort (6.9%). [57]

A descriptive, cross-sectional and retrospective study was conducted by Francisca Camacho-Morell et al., in 2017 to analyze factors affecting the performance of an episiotomy in spontaneous vaginal deliveries at La Ribera University Hospital (HULR). Data about spontaneous vaginal births that took place in 2015 was gathered. A total of 1,116 spontaneous vaginal births (62% of the total) were included in the analysis. 83% of these cases did not involve an episiotomy. A statistically significant correlation was discovered between the variables: lithotomy position, stimulated/induced labor, use of epidural anesthesia, and primiparity when performing an episiotomy. [58]

A Randomized controlled trial (RCTs) was conducted by Hong jiang et al in 2017 to assess the effects on mother and baby of a policy of selective episiotomy ('only if

needed') compared witha policy of routine episiotomy ('part of routine management') for vaginal births. The Cochrane Pregnancy and Childbirth Trials Register (as of September 14, 2016) and the reference lists of the studies that were found were searched. Randomized controlled trials (RCTs) comparing the use of episiotomy selectively versus routinely, regardless of the surgical type, parity, or environment. Cross-over trials, or quasi-RCTs, were conducted. Twelve studies (6177 women) are included in this revised review; eleven of the studies focus on laboring women who planned to give birth vaginally, and one study anticipates an aided birth. There were two studies (from Argentina and the UK) with over a thousand women each, and the other trials (from Canada, Germany, Spain, Ireland, Malaysia, Pakistan, Columbia, and Saudi Arabia) had fewer participants. Only primiparous women participated in eight studies, while both primiparous and multiparous women participated in four trials. Thus, the review shows that believing that routine episiotomy reduces perineal/vaginal trauma is not justified by current evidence. [59]

A descriptive cross-sectional study was conducted by Masoumeh Rasouli et al., in 2016 on a population consisting of all women that had vaginal childbirth overa six-month period (from October 2014 to April 2015) in Fatemieh Teaching hospital in Shahroud city. A census was used to choose the participants. A four-part questionnaire designed by the researcher was used to collect the data. Of the 978 cases of vaginal births that were included, 406 (41.5%) underwent episiotomies, and the mean age of the participating women was 27.32±5.14 years. It was discovered that there was a significant correlation ($P<0.05$) between episiotomy and the mother's age, parity, first and fifth minute Apgar ratings, length of the second stage of labor, birth spacing, oxytocin use, vacuum births, and painkiller use. 34.7% of people had an intact perineum overall. This study's overall episiotomy rate of 41.5% is significantly greater than the

World Health Organization's (WHO) recommended threshold. [60]

A prospective case control study was conducted by Apurva et al in 2016 in Obstetrics and gynecology ward of Krishna Institute of Medical Sciences, Karad, from November 2013 to June 2015. 200 patients had restricted episiotomy and two hundred individuals received regular episiotomy. In the control group, 95% of pregnant women had episiotomies without any extensions, and 10 pregnant women had third degree tears. In the study group, 75% of women had first degree tears and 22.5% of women had second degree tears without any post-partum hemorrhage. Upon follow-up, only two of the patients in the study group had dyspareunia; three patients reported improper wound healing; one patient each reported anorectal and urine incontinence; four patients in the control group also reported dyspareunia. In addition to having greater pelvic muscle strength than the usual group, the study group also experienced decreased perineal pain, perineal tears, wound dehiscence, and infections. So overall maternal morbidity was less among study group. The study concludes that routine episiotomy has less morbidity compared to the restrictive episiotomy. [61]

A descriptive, cross- sectional analytical study was conducted by Carmen Ballesteros-Mesegue et al. in 2016 to determine study related to Episiotomy and its relationship to various clinical variables. Parity, gestational age, onset of labor, usage of epidural analgesia, oxytocin, position of fetal expulsion, weight of the newborn, and completion of birth were among the variables covered in the study. The study comes to the conclusion that 50% of episiotomies were performed worldwide. Primiparity and the mentioned study have a significant correlation (RR=2.98). Additionally, a decreased incidence of episiotomy was linked to maternal age ≥35 years (RR=0.85) and infant weight; nonetheless, the results indicate that episiotomy depends on obstetric interventions carried out during delivery. [62]

A case–control study was conducted by Mona Stedenfeldt et al.,in 2014 investigating 74 women with vaginal birth, all with an episiotomy. Among these, 37 women sustained Obstetric anal sphincter injuries OASIS were compared to 37 women without OASIS. The vacuum/forceps was matched between the two groups. Symptoms of sexual problems, urinary incontinence, and anal incontinence were collected using self-administered questionnaires and St. Mark's grading instrument. The characteristics of the episiotomy were examined, and the group as a whole evaluated the outcomes. This study shows that having an episiotomy with preventative qualities does not have the same negative sequelae as having a sphincter injury. [63]

SECTION-B: LITERATURE RELATED TO

EPISIOTOMY WOUND HEALING

An experimental study was conducted by Biswas C. in 2000 on effectiveness of infra red radiation (I.I.R) on episiotomy wound healing. The study's findings indicate that on the first postnatal day, the majority of the control group (89.29%) and the experimental group (78.57%) had acute discomfort in the episiotomy wound. On the third and fifth postnatal days, 92.86% of the experimental group exposed to I.I.R. reported no pain in the episiotomy wound, compared to 0% and 25% of the control group treated according to standard episiotomy care methods, respectively. Results also indicate that mothers receiving I.I.R. had less discomfort and improved episiotomy wound healing. The study's conclusions demonstrate that infrared radiation. [64]

A randomized controlled trial was conducted by Fatemeh sheikhan,et al in 2012 to assess the application of cooling devices in a new approach in pain relief but the painrelated to episiotomy is typically treated with oral analgesic medications. 60 eligible pregnant women from Kamali Hospital in Iran participated in this research trial.

Two groups were randomly assigned: the control group (getting the hospital routine) and the case group (using Gel pads). VAS and REEDA scales are used to evaluate participants. After the episiotomy, pain was assessed 4, 12, and 5 days later. The independent t-test and chi-square were used in SPSS 14 to evaluate the acquired data. T = 10.1234 and t = 12.9549 are the results. In this study, the efficacy of using cold gel pads in place of betadine for episiotomy wound care was assessed four, twelve, and five days following the procedure. The independent t-test and chi-square were used in SPSS 14 to evaluate the acquired data. T = 10.1234 and t = 12.9549 are the results. This study shows that using cold gel pads instead of betadine episiotomy wounds was more effective.[65]

SECTION-C: REVIEW OF LITERATURE RELATED TOEPISIOTOMY PAIN PERCEPTION

A study conducted by John E, Sheebu E, Vimiji M, Seema S in 2009 on"The intention of assessing the effect of application of infrared radiations in episiotomy wound healing and relief of pain", found that the study would help health professionals to introduce the practice of infrared light application while providing episiotomy care to post natal mothers. Applying dry heat to the area improves blood circulation, which helps the episiotomy wound heal and relieve discomfort. London, Ladewing, Olds. (1994) states that the sitz bath's warmth relieves discomfort, reduces pain, and increases tissue circulation. This lowers the risk of infection and encourages healing. TID and PRN orders for Sitz bath are accepted. Cleaning the sitz tub or portable sitz is the first step in preparing the sitz bath. After that, add water at 102 to 105ºF. After the sitz bath, the lady should be monitored for 20 minutes, during which time she

should be checked for symptoms such as lightheadedness, a floating or spacy feeling, or hearing loss. After that, she should dry her perineum with a towel and replace her perineal pad. [66]

A quasi experimental study was conducted by Sali Anita in 2007 on **"**Effect of Sitz bath versus Gugguldhupan in pain related to episiotomy" . Convenience sampling was the technique used, and a total of 60 samples were collected. The majority of the samples, 83.3%, were between the ages of 19 and 24; 70% had completed secondary education; 80% were housewives; and 60% were primiparas. Based on their self-assessment pain level, 53.33% of moms reported severe pain prior to receiving a Sitz bath, and 56.7% reported mild pain following therapy, both of which showed statistical significance. As a result, sitz baths are a useful treatment option for patients with perineal wounds. [67]

A randomized controlled trial was conducted by Ana Carolina et al., in 2009 to characterized and measure perineal pain. They chose forty puerperal primiparous women from Sao Paulo, Brazil, who had episiotomies during normal vaginal deliveries. The McGill questionnaire, translated into Brazilian Portuguese, was used to gauge the degree of pain intensity. Following the intervention, the researcher observed that individuals had moderate intensity perineal pain, with a mean pain level of 4.2. [68]

A prospective study was conducted by Leeman in 2009 to find out the genital trauma during birth and assess the pain at postpartum period and the use of analgesic effect among 565 midwifery patients at University of new Mexico School of Medicine, USA. Perineal pain was measured using the McGill pain scales, the visual analogue scale, and the Present Pain Intensity (PPI). The study's conclusions demonstrated that, while women who had major trauma with episiotomy reported higher levels of pain scores ($p<0.001$) and were more likely

to use analgesic medications (p=0.002), women who had minor trauma with episiotomy and spontaneous perineal trauma reported very low rates of postpartum perineal pain. [69]

SECTION-D: REVIEW OF LITERATURE

RELATED TO EFFECTIVENESS OF DRY HEAT

APPLICATION

A randomized controlled trial was conducted by Elizabeth Rani in 2019 to assess the effectiveness of Infra-red radiation therapy on pain perception and wound healing among primi postnatal women with episiotomy in Christian mission hospital, Madurai. Using the purposive sample technique, 60 postnatal women were included in the study: 30 were assigned to the experimental group and 30 to the control group. The anticipated data gathering was carried out. The process of gathering data took six weeks. After analyzing the collected data, the study objectives were interpreted. The efficacy of infrared radiation therapy was determined using the paired t-test and the independent t-test. There was a significant difference at the 0.05 level in the comparison of the experimental and control groups' pre- and post-test scores for pain perception and wound healing status. According to the study's findings, infrared radiation treatment effectively decreased wound healing and episiotomy pain. Consequently, infrared radiation therapy ought to be applied in addition to episiotomy therapy.[70]

A non-randomized controlled clinical trial was conducted by Reem Bassiouny Mahmoud et al., in 2018 on 80 post-partum mothers having normal vaginal delivery with episiotomy who were admitted in Maternity ward at the National Medical

Institute of Damanhour City. Women were divided into two groups at random. In this instance, each odd number was allocated to the control group, which only received standard care, and each even number was allocated to the study group, which received both standard care and infrared light therapy. A systematic interview schedule, a self-reported Numerical Pain Rating Scale, and an observational checklist for the REEDA Scale were used to gather data. Within four days, restorative care is provided, and the REEDA total score was statistically significant. According to the study's findings, infrared lamp therapy is a suitable method for treating episiotomy wounds in puberty-aged women. Infrared treatment should be incorporated into postpartum instructions for women, according to the study, as it plays a critical role in enhancing their quality of life during the postpartum period. [71]

A randomized controlled trial was conducted by Pratibha Khosla et al.,in 2017 to assess the effectiveness of dry heat on reducing pain and wound healing . On the first, third, and fifth postnatal days, 20 participants from the experimental and control groups were measured using the universal pain scale and the REEDA scale. Both the experimental group's degree of discomfort and wound healing significantly improved. The results of the study demonstrated the effectiveness of infrared lamp radiation therapy as a pain management strategy for episiotomy wounds. [72]

A non-randomized controlled trial was conducted by Gomathi et al., in 2017. The aim of this study is to evaluate the effectivenessof infrared radiation lamp therapy for pain relief of episiotomy wound among postnatal mothers by comparing experimental and controlled group score. After obtaining written consent, all patients between the ages of 18 and 34 were included in the trial. The experimental

group received three days of infrared radiation therapy, while the control group received standard prenatal care. Every postpartum mother who has had an episiotomy wound, had a forceps or vacuum birth during the first three days of the postpartum period, and had a right or left mediolateral episiotomy. Compared to the control group, the experimental group's postnatal mothers experienced pain reduction from their episiotomy wounds. Radiation therapy with infrared lamps is a useful therapeutic option for episiotomy wound discomfort. [73]

A randomized controlled trial was conducted by Premila et al., in 2016 to assess the effectiveness of infrared therapy on episiotomy pain among postnatal mothers. in selected Hospital Karaikal. 50 new mothers from Karaikal's government general hospital were chosen through basic randomized sampling methods. To evaluate the pain, a numerical Mc Caffery pain rating scale was employed. Both descriptive and inferential statistics were used in the collection and analysis of the data. In the pretest, the majority of mothers had pain: 40% reported severe pain, 24% reported moderate pain, and 36% reported light pain. While the majority of moms (62%), experienced mild discomfort at the time of the episiotomy, and the minority (18%) experienced significant pain during the post-test period. The Chi-Square test was used to associate the severity of discomfort with various demographic characteristics. Despite the lack of a statistically significant correlation between knowledge level and demographic factors such place of residence, family structure, religion, educational status and monthly income. There was a statistically significant association found between level of knowledge and demographic variables such as age, food pattern and occupation of primi mothers. [74]

A randomized controlled trial was conducted by Nethravathi et al., in 2015 to assess the condition of episiotomy wound among post natal mothers in experimental and

control group. To compare the scores of the experimental and control groups in order to assess the impact of infrared lamp therapy on the healing of episiotomy wounds in postpartum mothers. In this study, postpartum moms hospitalized to Yadiyur maternity hospitals' postnatal wards were divided into two groups: the experimental group, which came from Krishna Institute of Medical Sciences hospital and research center, and the control group. This was done using a simple random sampling approach. The lottery method was used to achieve randomization. The study comprised mothers who had undergone mediolateral episiotomy, either on the left or right. The sociodemographic information was gathered by a structured interview schedule, and the observational check list known as the "REEDA scale" was utilized to evaluate the episiotomy wound. For a total of three days, the experimental group received normal treatment together with infrared lamp therapy. There was significant improvement in wound healing in experimental group as compared to control group. Infra red lamp therapy is an effective method of treatment on healing of episiotomy wound among post natal mothers. [75]

A randomized controlled trial was conducted by Venkadalekshmi et al in 2010 to assess the effectivenessof infra red therapy on episiotomy wound healing and pain in postnatal mothers at selected hospitals in Kovilpatti. The sample size was 60, with 30 members each from the control and experimental groups that were chosen at random. The episiotomy wound was evaluated using the REEDA scale, and the pain intensity scale was utilized to gauge pain. For ten minutes, the experimental group's individuals received infrared therapy. Measurements of episiotomy pain were taken before, right after, and three hours following the application throughout the course of three days. According to the findings, there

was a statistically significant difference ($p<0.001$). [76]

SECTION-E: LITERATURE RELATED TO EFFECTIVENESS OF MOIST HEAT APPLICATION

A randomized controlled trial was conducted by Jyoti Kapoor, et al in 2018 to assess the effectiveness of medicated and non medicated sitz bath on episiotomy wound healing among postnatal mothers at Govt. SMGSMaternity Hospital, Jammu (J&K). Forty new mothers made up the sample (20 in the experimental group and 20 in the control group). The sample was chosen with the use of purposeful sampling approach. The subjects' information was gathered using a sociodemographic profile, an obstetrical history variables tool, and the REEDA scale. The findings showed that sitz baths, whether medicated or not, are equally beneficial for postpartum mothers' episiotomy wound healing. [77]

A quasi-experimental study was conducted by Pratibha Khosla et al in 2017 to explore the effectivenessof sitz bath on episiotomy wound healing and level of pain. According to the study, the mean for the experimental group (sitz bath) was 2.5 on day 1, 2.05 on day 3, and 1.7 on day 5. In moist heat, the mean rate of wound healing was 6.95 on the first day, 5.6 on the third, and 2.5 on the fifth.In contrast, the control group's mean pain on day one was 2.95, on day three it was 2.5, and on day five it was 2.05.The first day's mean wound healing was 11.3; the third day's mean was 7.5.Day five was 2.95.The results indicate that sitz baths had a greater impact on episiotomy wound healing and pain relief than no intervention at all. [77]

A quasi-experimental study was conducted by Ribie Annie Varghese et al., in 2016 to determine the efficacy of hot application on sixty postnatal mothers with medio

lateral episiotomy of normal vaginal delivery that were selected by purposive sampling from postnatal ward of Government Taluk Hospital, Nedumangadu. The clinical data sheet, a numerical rating scale for evaluating episiotomy pain, and an interview schedule for gathering sociodemographic performa were the instruments employed for data collection. In the experimental group, thirty individuals were given warm water (380–410°C) for twenty minutes once a day for 24 hours following birth. Twenty minutes following the intervention, both groups' posttests were administered while they were nursing. The study's findings indicate that the experimental group's episiotomy pain was less severe than that of the control group at ($p < 0.01$). According to the study's findings, applying heat significantly reduces episiotomy pain. This non-invasive method can be used to lessen episiotomy discomfort. [78]

A quasi-experimental study was conducted by Ragania in 2016 to assess the effectiveness of Povidone-Iodine Sitzbath versus Lavender Oil Sitzbath on episiotomy pain and wound healing among postnatal mothers. Using the non-Probability Convenient sampling technique, 30 postnatal moms were assigned to Experimental group I and another 30 postnatal mothers were assigned to Experimental group II. Experimental group I received the Povidone Iodine Sitzbath intervention, while Experimental group II received the Lavender Oil Sitzbath (five days of therapy for each patient). With the aid of the Jack Harich Verbal Descriptive Pain Assessment Scale and REEDA, the level of episiotomy pain and wound healing was evaluated. For both Experimental Group I and II, the average episiotomy pain score was 1.1 ±0.83. For Experimental group II, the mean value was 1.766± 0.918. The P value was 0.005 and the unpaired t test value was 2.9210. Lavender Oil Sitzbath was suggested to be useful in lowering episiotomy pain among postnatal mothers undergone normal vaginal delivery. [79]

A quasi experimental study was conducted by Amandeep et al in 2015 to assess the effectiveness of sitz bath in reduction of episiotomy pain and wound healing among postnatal mothers admitted in postnatal units of DMC&H and Deep Hospital,Model town, Ludhiana, Punjab. Sixty postpartum mothers with episiotomy made up the sample (30 in each experimental group and 30 in the control group). The control group had standard care, whereas the experimental group had a sitz bath. The Modified Davidson REEDA scale was used to assess wound healing, while the Numerical Pain Scale was used to assess pain. The results showed that applying a sitz bath was beneficial for promoting wound healing and reducing episiotomy discomfort (p=0.01). [80]

A quasi experimental study was conducted by Bairavi et al in 2015 to assess the effectiveness of hot application on episiotomy wound healing and pain among the postnatal mothers in Thanjavur. Potassium permanganate was administered in a hot sitz bath. The current study employed a true experimental post test only design as its research methodology. For this study, sixty postpartum women were randomly selected from the postpartum ward of Our Lady and KRA hospital (experimental and control groups, each with thirty women). The interviewing sheet, the numerical rating scale, and the standardized REEDA Scale were the instruments utilized to collect the data. Ultimately, the statistical study showed that hot application surpasses routine care. [81]

A quasi experimental study was conducted by Gladis et al in 2013 to assess the effectiveness of medicated and non medicated sitz bath in episiotomy healing on postnatal mothers admitted at Bangalore‖ quasi–experimental Design was selected for the study. Samples of fifty postpartum mothers who had undergone episiotomy were collected. An observational checklist and a convenient sampling technique were utilized to evaluate the healing of the episiotomy wound using the REEDA scale. Day

1 mean scores in the medicated group are 5, and by Day 5, mean scores have dropped to 0.64. Day 1 mean percentage for the medicated group is 33.3; Day 5 mean % decreased to 4.2; Day 1 mean percentage for the non-medicated group is 33.6; Day 5 indicates a slight difference of 27.73. Day 3 (7.76), Day 4 (6.54), and Day 5 (7.17) acquired t-values are found to be significant. This indicates that the medicated group heals episiotomy wounds more quickly than the non-medicated group. [82]

A quasi experimental study was conducted by Babarinsa et al in 2012 to assess the effectiveness of warm water sitz bath on episiotomy wound healing among postnatal mothers in Bhopal. Sixty of the samples he chose were given a warm water sitz bath, and thirty were assigned to the control group. The episiotomy wound state was measured using the REEDA scale. For this investigation, a pre- and post-test design was employed. They came to the conclusion that a sitz bath aids in improving wound healing following an episiotomy after the results demonstrated a significant reduction in the status of episiotomy wound healing. [83]

A quasi experimental study was conducted by Ramler. D., Roberts. J., in 2007 to assess the effect of Povidone-Iodine Sitzbath versus Self perineal care on episiotomy wound healing. Forty new mothers were chosen. Povidone Iodine sitzbath was administered to twenty postpartum women, while self-perineal care was taken by another twenty mothers. The results show that povidone-iodine sitzbath has a major impact on the healing of wounds. According to the study, the experimental group's REEDA score was significantly lower ($p=0.007$). According to the study's findings, povidone-iodine sitzbath helps episiotomy wounds recover. [84]

SECTION-F: REVIEW OF LITERATURE RELATED TO COMPARING THE EFFECTIVNESS BETWEEN DRY HEAT AND MOIST HEAT APPLICATION ON EPISIOTOMY WOUND

A study was conducted by Jacob J. in 2009 on "effectiveness of Sitz bath versus Infra red lamp on episiotomy wound healing" found that, Following 30 samples' treatment with a Sitz bath, there was a 47% change in the approximate size of an episiotomy wound, a 77% reduction in exudates, a 100% decrease in edema, and a 100% decrease in pain score. This demonstrates that Sitz bath was a successful intervention to enhance the healing of episiotomy wounds. Following Infra Red lamp treatment, 33 percent of patients moved to the scale of a complete approximation of an episiotomy wound, with 57 percent fewer exudates, 100 percent less edema, and 100 percent less pain. These results demonstrate that Infra Red lamp treatment was an effective intervention to improve episiotomy wound healing. The results of the comparison between the two treatments showed that Sitz bath was more successful than infra red lamp on parameters of approximation, exudates and edema while infra red lamp was more effective on parameter of pain. [85]

A quasi experimental study was conducted by Dhanalakshmi. V in 2010 to determine the effectiveness of infrared therapy and Povidone-Iodine Sitzbath of episiotomy wound healing at Coimbatore in Tamil Nadu. For the study, 30 samples were chosen at random, with 15 in each of the two experimental groups. For three days, one experimental group received infrared therapy in the morning and the other, Sitzbath therapy in the evening. In comparison to moms who received a Povidone-Iodine Sitzbath, the results showed that mothers who received infrared therapy saw a decrease in pain severity. In conclusion, it was discovered that the effects of Povidone-Iodine sitzbath and infrared light

treatment on the healing of episiotomy wounds were found to have the same effect . [86]

A quasi-experimental study was conducted by Poonam Sheoran et al in 2016 to compare the effectiveness of infra red light therapy vs. sitz bath on episiotomy in terms of episiotomy wound healing among postnatal mothers. The study was conducted in postnatal wards of Government multi speciality hospital, Chandigarh. Using purposive sampling, a sample of sixty postnatal women with episiotomies was chosen; of these sixty postnatal moms, thirty underwent infrared light treatment and the remaining thirty underwent sitz bath treatment. The REEDA Scale was utilized to gather data. Data analysis showed that while both infrared light therapy and sitz baths were useful in accelerating the healing of episiotomy wounds, sitz baths were noticeably more successful in doing so. [87]

A comparative study was conducted by Helen Hema Bai et al in 2012 to assess theeffectiveness of infra red light therapy and warm water sitz bath on episiotomy wound healing status and level of pain perception among postnatal mothers in selected primary health centers at kanyakumari district. When compared to postnatal moms in Group B who had a warm water sitz bath, postnatal mothers in Group A who received infra red light therapy administration demonstrated a highly significant decrease in the level of pain perception ($p<0.05$) and wound healing status ($p<0.05$) on episiotomy. At the episiotomy site, infrared light therapy dramatically increased the wound healing status, decreased pain perception, increased postnatal mothers' comfort, and speed up their recuperation. [88]

A randomized controlled trial was conducted by Navdeep Kaur et al in 2013 to assess the effect of dry heat versus moist heat on episiotomy pain and wound healing in PGIMER, Chandigarh. Eighty-six subjects were enrolled by purposive sampling and

later on allocated randomly into two groups (group 1- dry heat, group 2- moist heat). A modified REEDA was used for wound healing, and a modified numerical pain rating scale was used for measuring pain. The anticipated data gathering was carried out. The process of gathering data took six weeks. After analyzing the collected data, the study objectives were interpreted. The efficacy of infrared radiation therapy was determined using the paired t-test and the independent t-test. The study's conclusions showed a highly significant difference in the groups' wound healing and pain scores [$p<0.05$ on day 14 and $p<0.001$ on day 7 for wound healing scores] and [$p<0.001$ on day 7 and $p<0.01$ on day 14 for pain scores]. Even though both treatments worked, dry heat relieved pain more effectively than moist heat in relieving pain and promoting wound healing at the episiotomy site. [89]

A quasi experimental study was conducted by Aruna et al., in 2017 to assess the effectiveness of moist heat and dry heat application on healing of episiotomy wound among postnatal mothers. Pre-test post-test quasi experimental design was one of the quantitative experimental designs chosen for the investigation. The study was carried out in Nellore's Narayana Medical College Hospital's postnatal ward. Postpartum mothers were the study's target population. Postpartum mothers make up the study's sample population. The study's sample size comprised sixty mothers who had recently given birth. The non-probability convenience sampling method was used to choose the samples. In terms of redness, edema, discharge, and estimation, dry heat outperforms wet heat by 9%, 8%, 2%, and 11%, respectively. Both moist and dry heat applications have been proven to be equally beneficial for ecchymosis. [90]

A quasi experimental study was conducted by Budhi Baruah et al in 2010 to assess the effect of infrared radiation in episiotomy wound healing. Purposive convenient sampling was utilized to include 50 postnatal mothers in the study, which followed a quasi-experimental design. The experimental and control groups wound healing was

evaluated using a modified REEDA scale. The results of the investigation showed that infrared is superior for wound healing and pain relief. There is no correlation between wound healing and demographic factors such as age, parity, body weight, and Hb gm%.[91]

Research gap analysis :

The reviewed literature on the effectiveness of dry heat vs moist heat on episiotomy wound healing and pain perception lacks some evidences. However, a research gap is identified in the literature ,emphasizing the need for integrated studies that determine the effect of these interventions on the on other parameters as well.

Mostly studies were found the immediately effectiveness of warm compression and sitz bath but there is more need to explore evidence regarding effectiveness of warm compression and infrared rays at the episiotomy site.

Summary

The literature review presents a comprehensive exploration of the effectiveness of moist heat and dry heat on episiotomy wound healing and pain perception among postnatal mothers. Various studies highlight the efficacy of the use of dry heat and moist heat and other pharmacological and non-pharmacological techniques in addressing the specific aspects of maternal well-being such as the use of infrared lamp therapy and warm compression at the episiotomy wound site to reduce the pain intensity and enhance the wound healing status of the postnatal mothers.

However, a research gap is identified in the literature ,emphasizing the need for integrated studies that determine the effect of these interventions on the on other parameters as well.

CHAPTER III

MATRIALS AND METHODS

MATERIALS AND METHODS

Research methodology is the research designed to develop or refine methods of obtaining, organizing or analyzing data .

This phase of study included selecting a research design, variables, setting of the study, population, sample, inclusive and exclusive criteria for sample selection, sample size, sampling technique, development and description of the tool, content validity, pilot study, reliability ,ethical considerations and procedure for data collection and plan for data analysis.[77]

RESEARCH APPROACH

Quantitative research approach is essentially about collecting numerical data to explain a particular phenomenon, particular questions that seem immediately suited to being answered using quantitative methods. [77]The quantitative research approach was used for the present study.

RESEARCH DESIGN

The research design is the master plan specifying the methods and procedures for collecting and analyzing the needed information in a research study. The research design adopted for the study is a **Quasi-experimental study design**.

In this study, the pre assessment level of episiotomy wound healing and pain perception of Dry heat and Moist heat group were measured by using the REEDA scale and Visual Analogue Scale (VAS) respectively.

Pre-test assessment followed by administration of infra red light therapy and warm compression. On third day the post-test assessment of episiotomy wound healing and level of pain perception will be obtained from the postnatal mothers of Dry heat and Moist heat by using the same scale.

Table 1 - Symbolic representation of the study design

Group	Pre Test	Intervention	Post Test
Dry Heat Group	O1	X1	O2
Moist Heat Group	O1	X2	O2

KEY NOTES

- O_1 – Pre-test level of pain perception and episiotomy wound healing
- O_2 – Post -test level of pain perception and episiotomy wound healing
- X_1– Dry heat application (Infrared light therapy)
- X_2- Moist heat application (Warm compression)

RESEARCH VARIABLES

Independent Variable

In this study, the independent variables are dry heat (infrared light) and moist heat (warm compression)

Dependent Variable

In this study, the dependent variables are episiotomy wound healing and pain perception among postnatal mothers.

Demographic Variables

In this study, the demographic variables are Age, Education , Occupation, Type of family, Dietary pattern.

Clinical Variables

In this study, the clinical variables are Body mass index (BMI), Parity, birth weight of baby, history of any present illness, currently receiving any analgesic, received any specific type ofperineal exercise , type of episiotomy.

STUDY SETTING

Setting is the general location and condition in which data collection takes place for the study. [37]

The study was conducted in the post natal ward of AIIMS Bhopal. It is a 1100 bedded tertiary care hospital and referral centre. This institute was unveiled on 26th January, 2013 for public service. The hospital is renowned for its excellence in medical expertise, nursing care and quality diagnostic services. All facilities are provided for conducting normal, high risk and instrumental deliveries. The postnatal ward in AIIMS Bhopal takes around 70 cases per month where the mothers and their babies are provided the best medical care and treatment immediately after the birth of the baby. It takes only the normal vaginal delivery cases. Various departments such as family planning, blood bank, dental endocrinology, human milk bank neonatal intensive care units and oncology ward which are providing comprehensive care for entire Madhya Pradesh and for neighboring states.

DURATION OF THE STUDY

The study was conducted for a period four weeks.

STUDY POPULATION

Target Population

The population is defined as the entire set of individuals or objects having common characteristics sometimes called universe.[78.] The target population of study is postnatal mothers who have undergone vaginal delivery with episiotomy wound at selected tertiary care hospitals of Bhopal.

Accessible Population

Accessible population of the study is postnatal mothers who have undergone vaginal delivery with episiotomy wound at All India Institute of Medical Sciences ,Bhopal and who are willing to participate in the study and available at the time of data collection.

SAMPLE

A subset of a population, selected to participate in a study [79].The samples for the present study included postnatal mothers.

SAMPLE SIZE

The sample size for the study was calculated using the OpenEpi [80] software version 3 based on the results of previous studies. The parameters assumed in the sample size calculation are as follows;

Confidence interval (2-sided)=95%, Power=80%,

Ratio of sample size (Group2/Group1)=1

Mean and standard deviation (Group1)= 1.723±0.782 [81]

Mean and standard deviation (Group2)=2.103±0.594

Calculated sample size was 52

The attrition (non-response) rate for the present study was assumed to be 10%

Sample size including non-response rate is 52 (26 in each group)

Researcher rounded off the sample size to 60 (30 in each group)

The sample size for the study consisted of sixty postnatal mothers. Outof which, thirty were in Dry heat and thirty were in Moist heat.

SAMPLING TECHNIQUE

Sampling is the process of selecting sample from the target population to represent the entire population. Non-probability convenient sampling technique was used in this study .

CRITERIA FOR SAMPLE SELECTION

Inclusion Criteria

1) Postnatal mothers following 12 hours of vaginal delivery with episiotomy.
2) Postnatal mothers who are willing to participate in the study.
3) Postnatal mothers who are conscious and oriented.

Exclusion Criteria

1) Postnatal mothers with infected perineum and sexually transmitted diseases.
2) Postnatal mothers who had home delivery.
3) Postnatal mothers with any psychological disorder

SAMPLING PROCEDURE

Non-probability convenient sampling technique used for present study.

The samples were taken based on postnatal mothers who fulfilled the inclusion criteria. Samples were selected through convenient sampling technique.Among the selected samples thirty were taken for dry heat to have infra red light therapy and thirty were taken for moist heat group to have warm compression. . The researcher administered infra red light therapy for thirty postnatal mothers and warm compression for thirty postnatal mothers for 20 minutes for two times a day for three days. After three days of intervention the researcher checked the level of episiotomy wound healing and pain perception status by using the REEDA scale and Visual Analogue Scale (VAS) respectively in the dry heat and moist heat group .

DEVELOPMENT AND DESCRIPTION OF TOOL

Development of tool

The investigator prepared the tool according to the objectives of the study, in the light of literature which were reviewed and relevancy to the clinical practice. The tool was developed in context of the postnatal mothers with episiotomy admitted in tertiary care hospital ,Bhopal.

1. Extensive review of literature was done through books, national and internationaljournals, published researches to find out information about postnatal mothers with episiotomy.
2. Preparation of first draft of the tool including necessary questions which may show association with the episiotomy pain perception and wound healing.
3. Personal consultation and discussion with obstetricians, nursing experts, psychologist , guide and co-guide and suggestions were taken and made changes in the tool and find out the content validity index to make the questionnaire a valid tool.
4. 4. Preparation of final draft of the questionnaire and finalized the content of the questionnaires.

Description of the Tool

The tool consists of three sections,

Section-1 (A): Demographic Variables

It is a self-structured questionnaire which includes 5 items such as Age, Education, Occupation, Type of family, Dietary pattern.

Section-1 (B): Clinical Variables

It is also a self-structured questionnaire includes 7 items such as Body mass index (BMI), Parity, birth weight of baby, history of any present illness, currently receiving any analgesic, received any specific type of perineal exercise , type of episiotomy.

Section-2 : REEDA scale

It is a standardized tool for assessment of episiotomy wound healing (Open access) invented by Davidson and Carey in1971.REEDA scale to assess the episiotomy wound healing among postnatal mothers.

Components of REEDA scale:

Redness

Edema

Ecchymosis/Erythema

Discharge/Drainage

Approximation of wound edges

Scoring Procedure

SCORE	LEVEL OF WOUND HEALING
0-2	Healed
3-5	Moderately healed
6-8	Mildly healed
9-15	Not healed

STANDARDIZED REEDA SCALE

TABLE: 2 REEDA scale

Points	**Redness**	**Oedema**	**Ecchymosis**	**Discharge**	**Approximation**
0	None	None	None	None	Close
1	Within 0.25 cm of the incision bilaterally	Perineal less than 1 cm from incision	Within 0.25 cm bilaterally or 0.5 cm unilaterally	Serum	Skin separation 3 mm or less
2	Within 0.5 cm of the incision bilaterally	Perineal and/or vulvar, between 1 to 2 cm from incision	Between 0.25 cm to 1cm bilaterally or between 0.5 cm to 2 cm unilaterally	Serosan-guinous	Skin and subcutaneous fat separation
3	Beyond 0.5 cm of the incision bilaterally	Perineal and/or vulvar, greater than 2 cm from incision	Greater than 1 cm bilaterally or 2 cm unilaterally	Bloody, purulent	Skin, subcutaneous fat and fascial layer separation
Score					
					Total 15

Section-3: Visual Analogue Scale (VAS)

The visual analogue scale (VAS) is one of the standardized pain rating scales used for the first time in 1921 by Hayes and Patterson. It is often used in epidemiologic and clinical research to measure the intensity or frequency of various symptoms. Visual Analogue Scale (VAS) scale was used to assess the episiotomy pain perception among postnatal mothers.

Scoring Procedure

Visual Analogue Scale (VAS) scale was used to identify level of pain perception of the postnatal mothers which has the total score of 10.The score was interpreted

as follows,

SCORE	LEVEL OF PAIN
0	None
1-3	Mild
4-6	Moderate
7-10	Severe

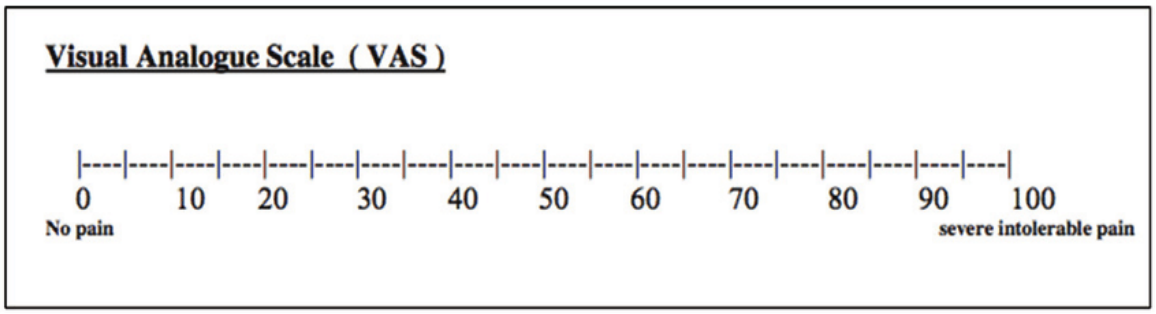


Figure 4: Visual Analogue Scale (VAS)

CONTENT VALIDITY OF THE TOOL

Validity is the degree to which an instrument measures what it is intended to measure.(Polit and Beck, 2010).

The content validity of the tool was done by 20 nursing experts,3 doctors, 7 nursing educators and 2 statistics expert. The validity of the tool was established with Obstetrical and Gynaecological experts. The tool was modified according to the suggestions and recommendations of experts and the tool was finalized. The language validity and reverse translation of the tool was done.

Table 3: Scale Content validity Index values

S.no	CVI Value	Sociodemographic questionnaires	Clinical Profile
1.	S-CVI(Ave)	0.94	0.96

Table 3-Table showing CVI index

Table 4 : Tool sections

S.no	Section of the tool	Type of tool	Data collection technique
1	Socio demographic data	Self- structured	Paper pen method
2	Clinical profile	Self- structured	Paper pen method
3	Visual analogue scale	Standardized	
4	REEDA scale	Standardized	

Table 4 -Table showing tool sections

RELIABILITY

Reliability denotes the degree of consistency or dependability with which an instrument measures an attribute.(Polit and Beck, 2010)

The reliability of tool used for episiotomy wound healing and pain assessment was tested by inter-rater reliability method. The reliability score obtained was r=0.93. Calibration certificate of lotion thermometer and infrared lamp was obtained. Hence the tool was considered highly reliable for proceeding with this study.

ETHICAL CONSIDERATION

This study was conducted after the approval from Institutional Human Ethics Committee (IHEC-SR) ,All India Institute of Medical Sciences ,Bhopal. Permission was obtained from Medical Superintendent, Principal-Nursing College, AIIMS Bhopal and notified HODs and Senior Nursing Officers of Obstetrics and Gynaecology department prior commencing data collection. All respondents were carefully informed about the purpose of the study and their part during the study and how the privacy was guarded. Confidentiality of the study result was ensured. The freedom was given to the postnatal mothers to leave the study at her will without assigning any reason. No routine care was altered or withheld. Thus the investigator followed the ethical guidelines which were issued by the institutional ethics committee. Written consent was obtained from all participants.

Ethical Clearance

Ethical clearance was obtained from the Institutional human ethics committee student research (IHEC-SR).the registration number was AIIMS /BPL/IHECSR/July/22/MscN/19 and the trial was registered under the clinical trial registry -INDIA(CTRI).The registration number for this trial was CTRI/2023//10/058227, Registered on 4/10/2023.

Administrative permission

The investigator took the permission from Medical Superintendent and Principal of NursingCollege, AIIMS Bhopal and also notified to HODs and Nursing Officers of Obstetric and Gynecology department prior to data collection.

Informed consent

The investigator provided the informed consent form and written participant information sheet was given regarding the details of the study and explained to all the postnatal mothers before enrolment to the study. The involvement of benefits and harm (none) as well as whom to contact in case of doubt were explained to the study participants. The confidentiality of the participant was maintained as the data was shared only with the guide and coguide.

Pilot study

A pilot study is defined as a small scale version, or trial run, done in preparation for a major study.(Polit and Beck, 2010)

It is a rehearsal for the main study. Permission was obtained from Medical Superintendent, Principal-Nursing College, AIIMS Bhopal and notified HODs and Senior Nursing Officers of Obstetrics and Gynaecology department prior commencing data collection. A formal permission was obtained from the Director of the Centre. The pilot study was conducted for a period of one week (06.10.2023 to 13.10.2023). The concerned nursing officers and duty doctors were also informed and their co-operation was also obtained. The sample size was six postnatal mothers with episiotomy wound selected through convenient sampling technique for the pilot study. Among that three received infra red light therapy and three received warm compression. Rapport was established with the postnatal mothers. Consent was obtained from the postnatal mothers to ensure their cooperation. The level of episiotomy wound healing and pain perception was assessed prior to infrared

therapy and warm compression with REEDA scale and Visual analogue scale respectively in both the dry heat and moist heat group. Then postnatal mothers with episiotomy were placed on dorsal recumbent position after the perineal area was cleaned and dried.

The infra red lamp was placed 50cm (20inches) distance from the perineum and the heat produced with 230 volts for twenty minutes for the postnatal mothers with episiotomy in dry heat group and for warm compression for moist heat group was provided. The basin was filled with warm water and checked the temperature of water with lotion thermometer (140-160 ^{o} F) . These procedure were carried out in the morning and evening for three days. Consent was obtained from each mother and reassurance was provided that the collected data would be kept confidential. The results of the pilot study showed that the infra red light therapy and warm compression were found to be effective in the healing of episiotomy. Mothers who had undergone the treatment of infra red light therapy expressed decreased pain intensity compared to mothers who had undergone the treatment of warm compression. The study was found to be feasible and hence the same procedure was decided to be followed in the main study. There was no modification made in the tool after pilot study. The samples selected for the pilot study were not included for the main study.

DATA COLLECTION PROCEDURE

Data collection period was done from 09.10.23 to 30.10.23 (4 weeks). After obtaining the permission from concerned authority the investigator selected postnatal wards of AIIMS Bhopal for data analysis. Pilot samples were not included in the main study. **It consists of following phases:**

Phase I: Pre assessment

The investigator introduced herself and established a good rapport by explaining the purpose of the study to the postnatal mothers who were in the postpartum period .Informed consent was obtained and confidentiality was maintained .The investigator assessed the episiotomy wound healing and pain perception among postnatal mothers with REEDA scale and Visual Analogue Scale (VAS) respectively in both Dry heat group and Moist heat group.

Phase II:Intevention

After assessing the pre-test the investigator administered the infra red heat lamp which was placed 50 cm (20 inches) distance from the perineum and the heat produced with 230 volts for twenty minutes two times per day for the postnatal mothers with episiotomy in dry heat group. The procedure were carried out in the morning and evening for three days. Apart from the intervention the mothers were provided routine care which included the standard care provided to them on a daily basis.

After assessing the pre-test the investigator administered warm compression to the postnatal mothers in moist heat group. The basin was filled with warm water and checked the temperature of water with lotion thermometer (140-160 ^{o}F) and warm compression was applied to the episiotomy wound area on theperineum, using a clean cloth of 10x10cm dimensions and 1 cm thick soaked in warm water and squeezing the excess water. The procedure were carried out in the morning and evening for three days.

Phase III: Episiotomy wound healing and pain perception was assessed by using the REEDA scale and Visual Analogue Scale (VAS) respectively in dry heat and moist heat group. On the day 3 of intervention, the

effectiveness of intervention was assessed in dry heat group and moist heat group with the same scale.

Procedure of data collection

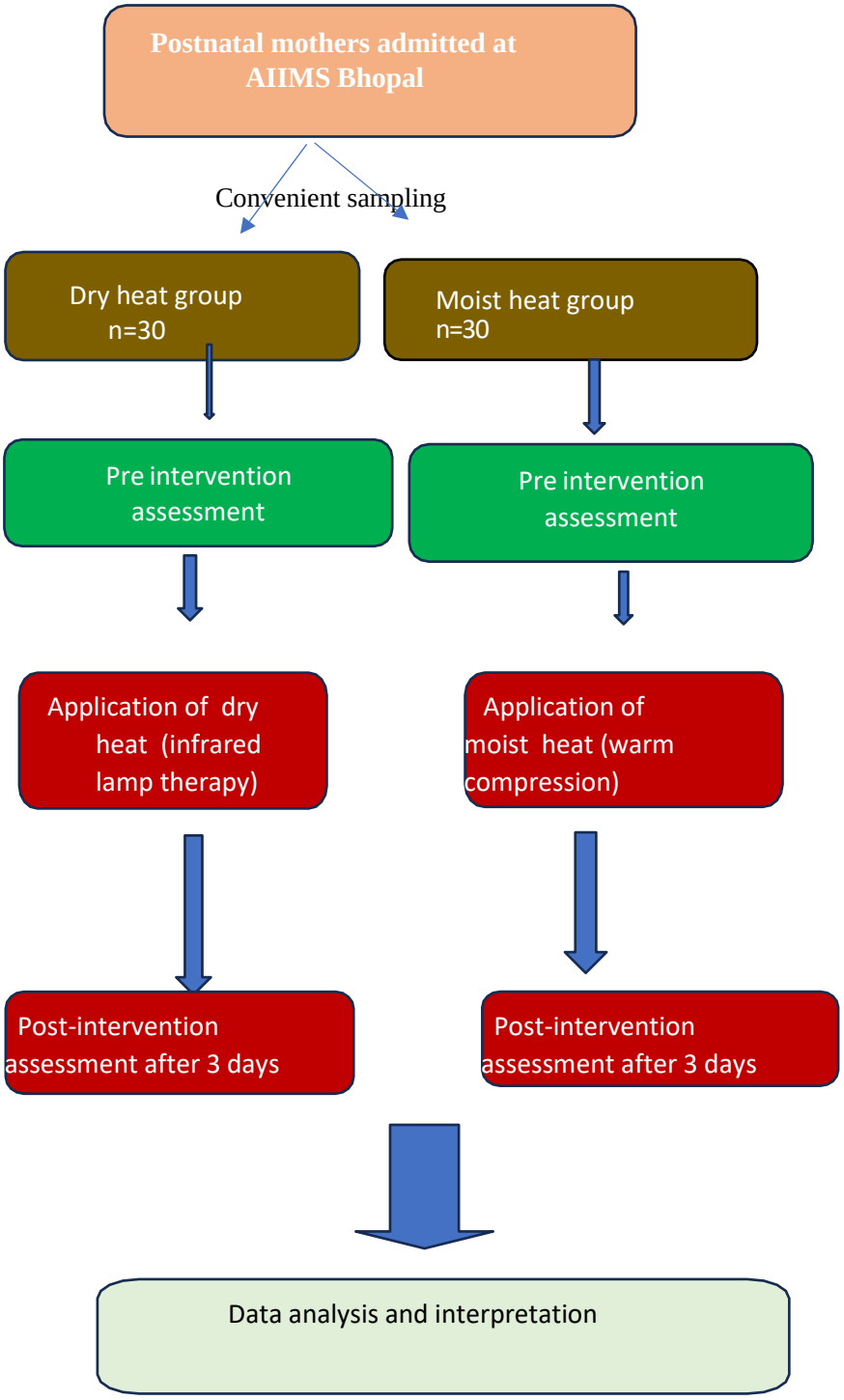

Postnatal mothers admitted at AIIMS Bhopal
Convenient sampling
Dry heat group n=30
Moist heat group n=30
Pre intervention assessment
Pre intervention assessment
Application of dry heat (infrared lamp therapy)
Application of moist heat (warm compression)
Post-intervention assessment after 3 days
Post-intervention assessment after 3 days
Data analysis and interpretation

Fig 5:Figure showing data collection procedure

INTERVENTION PROTOCOLS

Setting : All India Institute of Medical Sciences, Bhopal

Intervention : Infra red radiation, Warm compression

Duration & time : 20 minutes

Frequency : Twice daily for three days

Administered by : Investigator

Recipient : Postnatal mothers vaginal delivery with episiotomy

Intervention protocol for dry heat application

Definition

In this study, dry heat refers to the application of infrared heat produced by the infra-red lamp which will be placed at 50cm (20 inches) distance from the perineum and the heat produced with 230 volts will be allowed to remain for 20 minutes two times per day for three days.

Purposes

- To increase blood flow to the area of wound.
- Promotes wound healing.
- Helps in localized treatment of pain.
- Helps in relaxation and stress reduction

Articles

Infra red lamp 230 volts

Draw sheet

Mackintosh

A medium -sized bowl

Normal saline

Sterile gauze pieces

Preliminaries

- Explain the procedure to the mother.
- Make the mother to void and advice her to clean the perineum thoroughly.
- Place the mother in a dorsal recumbent position.

Steps of the procedure

- Wash hands and gather equipments .
- Provide privacy and expose the perineum.
- Keep the mackintosh under the mother's buttocks.
- Clean the perineum and suture area with normal saline following sterile technique.
- Dry the perineum and suture area with sterile gauze piece

- Place the infra- red lamp will be placed 50 (20 inches) away from the perineal area that is to be treated as measured by a measuring tape.
- Check the comfort level of the mother and adjust the distance within the range of 50-60cm while providing dry heat.
- Dry heat will be provided for about 20 minutes two times per day for 3 days with gap of 8-10 hours in between.

After Care

- After the procedure, make the mother lie in a comfortable position and replace the articles in the utility room.
- Keep the area clean to prevent infection.
- Watch for signs of infection like redness ,pain, fever ,bruising ,burning sensation etc.
- Provide moral and psychological support to the patient.
- Ensure the hydration status of the mother after the procedure.

Documentation

- Record the procedure in the chart.
- Note for any abnormal findings or signs of infection during the procedure.

Intervention protocol for moist heat application

Definition

Moist heat refers to application of warm compression using a clean cotton cloth of 10x10 cm dimension and 1cm thick soaked in warm water with a temperature of 140-160°F (60-71°C) and applied and compressed on the episiotomy wound for 20 minutes two times per day for three days.

Purposes

- To increase blood flow to the area of wound.
- Promotes wound healing.
- Helps to relieve pain.
- Promotes drainage of fluid.
- Helps in relaxation and stress reduction.

Articles

Cotton cloth ;10x10 cm dimension and 1cm thickness,Basin(medium size)

Draw sheet

Mackintosh

A medium -sized bowl

Normal saline

Water [temperature- 140-160ºF(60-71 ºC].

Lotion thermometer

Sterile gauze pieces

Preliminaries

- Explain the procedure to the mother.
- Make the mother to void and advice her to clean the perineum thoroughly.
- Place the mother in a dorsal recumbent position.

Steps of the procedure

- Wash hands and gather equipment .
- Provide privacy and expose the perineum.
- Keep the mackintosh under the mother's buttocks.
- Clean the perineum and suture area with normal saline following sterile technique.
- Dry the perineum and suture area with sterile gauze piece.
- Test the temperature of the water with a lotion thermometer [140-160ºF(60-71 ºC].
- Dip the cotton cloth in a basin containing warm water for 30 seconds and squeeze out the excess water from the cloth.
- Provide warm compression for 20 minutes by reapplying it after every 5 minutesand check the temperature of water in during the procedure and changing it as required.
- After the procedure, assist the mother to dry and dress in clean clothes.
- Moist heat will be provided for about 20 minutes two times per day for 3 days with gap of 8-10 hours in between.

After Care

- After the procedure, make the mother lie in a comfortable position and replace the articles in the utility room.
- Keep the area clean to prevent infection.
- Watch for signs of infection like redness ,pain, fever ,bruising ,burning sensation etc.
- Provide moral and psychological support to the patient.
- Ensure the hydration status of the mother after the procedure.

Documentation

- Record the procedure in the chart.
- Note for any abnormal findings or signs of infection during the procedure.

PLAN FOR DATA ANALYSIS

The data was analyzed by using descriptive and inferential statistics.

DESCRIPTIVE STATISTICS

- ❖ Frequency and percentage distribution was used to analyze the demographic variables and clinical variables among postnatal mothers with episiotomy.
- ❖ Frequency and percentage distribution was used to assess the effectiveness of infra red light therapy and warm compression after

episiotomy among postnatal mothers.

- Median and inter-quartile range was used for pre and post test scores of episiotomy wound healing and pain perception among postnatal mothers in the dry heat and moist heat group.

INFERENTIAL STATISTICS

Mann-whitney U test was used to compare the effectiveness of infra red light therapy and warm compression among postnatal mothers in dry heat and moist heat group.

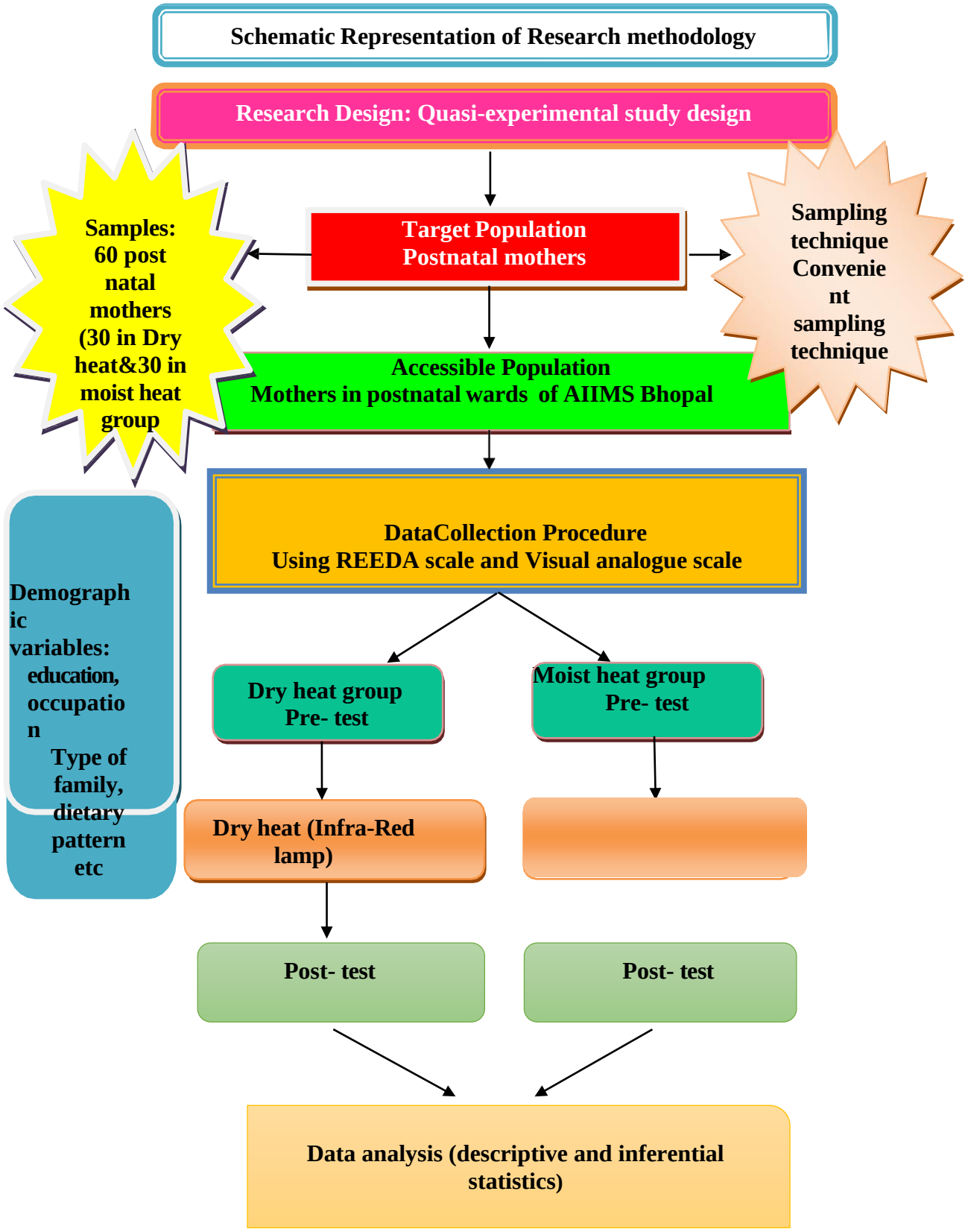
PROTECTION OF HUMAN SUBJECT

The proposed study was conducted after the approval of research committee of the college. Permission was sought from the Medical Superintendent of the hospital and HOD of Obstetrics and Gynecology Department, All India Institute of Medical Sciences, Bhopal . The oral and written consent of each individual was obtained before data collection. Assurance was given to the study participants regarding the confidentiality of the data collection.

Chapter summary

This chapter dealt with the research approach, design, variables ,sample ,sampling technique, description of tool and intervention, reliability, validity ,ethical considerations and pilot study.

FIGURE 6: SCHEMATIC REPRESENTATION OF RESEARCH METHODOLOGY


Schematic Representation of Research methodology
Research Design: Quasi-experimental study design
Samples: 60 post natal mothers (30 in Dry heat&30 in moist heat group
Target Population Postnatal mothers
Sampling technique Convenient sampling technique
Accessible Population Mothers in postnatal wards of AIIMS Bhopal
DataCollection Procedure Using REEDA scale and Visual analogue scale
Demographic variables: education, occupation Type of family, dietary pattern etc
Dry heat group Pre- test
Moist heat group Pre- test
Dry heat (Infra-Red lamp)
Post- test
Post- test
Data analysis (descriptive and inferential statistics)

CHAPTER IV

RESULT

DATA ANALYSIS AND INTERPRETATION

Data analysis is a process of inspecting ,cleansing, coding and transforming data with the goal of discovering useful transformation data informing conclusion and supporting decision - making.[94]

The term analysis refers to the computation of certain resources along with searching for patterns of relations that exists among data groups. Analysis of data in a general way involves a number of closely related operations, which are performed with the purpose of summarizing the collected data, organizing them in such a manner that they answer the research questions.[94]

This chapter deals with analysis and interpretation of findings collected from postnatal mothers who were admitted in postnatal wards of AIIMS Bhopal, using Self structure tool, Visual Analogue scale and REEDA scale .The collected data was transformed into interpretable form so that it can answer the research questions generated by the researcher.

The gathered data was analyzed using descriptive and inferential statistics according to the objectives and hypotheses of the study.

H0:There is no significant difference in the effect of dry heat and moist heat on episiotomy wound healing and pain perception among postnatal mothers at 0.05 level of significance.

H1:There will be a significant difference in the effect of dry heat and moist heat on episiotomy wound healing and pain perception among postnatal mothers at 0.05 level of significance.

ORGANIZATION OF DATA

The present study findings are delineated under the following headings:

Section-I

Findings related to the sample characteristics among the postnatal mothers in the dry heat and moist heat group.

Section-IA

Findings related to the socio-demographic variables among the postnatal mothers in the dry heat and moist heat group.

Section-IB

Findings related to the clinical variables among the postnatal mothers in the dry heat and moist heat group.

Section- II

Findings related to the assessment of pre-interventional and post-interventional episiotomy wound healing and painperception among the postnatal mothers in the dry heat and moist heat group.

Section-III

Comparison of the effectiveness of dry heat versus moist heat on episiotomy wound healing and pain perception among postnatal mothers.

Section-IV

Association between the post- test level of episiotomy wound healing and pain perception among postnatal mothers in dry heat and moist heat group with their selected demographic variables and clinical variables.

Section-I

Findings related to the sample characteristics among postnatal mothers in dry heat and moist heat group

This section deals with the description of socio-demographic and clinical variables of the sample(postnatal mothers)in terms of frequency and percentage. The dry heat group and moist heat group were homogenous in nature (Annexure 10)

Section-IA

Findings related to the socio-demographic variables among the postnatal mothers in the dry heat and moist heat group.

Table 5:Frequency , percentage distribution and homogeneity of demographic variables among the postnatal mothers regarding episiotomy wound healing and pain perception in both the dry heat and moist heat group.

N=60

Demographic variables		Group				Chi-square/ Fisher's exact test statistic	p value
		Dry heat (n=30)		**Moist heat (n=30)**			
		Frequency	%	Frequency	%		
Age (years)	15-19	0	0.0%	0	0.0%	0.884*	0.347
	20-25	16	53.3%	20	66.7%		
	26-30	8	26.7%	5	16.7%		
	>30	6	20.0%	5	16.7%		
Education	Professional degree	2	6.7%	0	0.0	0.267	0.606

(Kuppuswamy scale)	Graduate	14	46.7%	14	46.7%		
	Diploma	1	3.3%	0	0.0%		
	High school	10	33.3%	10	33.3%		
	Middle school	0	0.00%	0	0.00%		
	Primary school	2	6.7%	3	10.0%		
	Illiterate	2	6.7%	3	10.0%		
Occupation (Kuppuswamy scale)	Professional	1	3.3%	2	6.7%	0.001	0.999
	Semi-professional	4	13.3%	0	0.0%		
	Clerical/shop/farmer	1	3.3%	3	10.0%		
	Skilled worker	2	6.7%	2	6.7%		
	Semi-skilled	0	0.0%	0	0.0%		
	Unskilled	0	0.0%	1	3.3%		
	Unemployed	22	73.3%	22	73.3%		
Dietary pattern	Vegetarian	20	66.7%	19	63.3%	0.073	0.787
	Non-vegetarian	10	33.3%	11	36.7%		
Type of family	Nuclear	18	60.0%	19	63.3%	2.748*	0.432
	Joint	9	30.0%	9	46.7%		
	Extended	3	10.0%	2	30.0%		

*indicates Fisher's exact test result.

From Table 5 results, it is revealed that all the socio-demographic variables are homogeneously distributed across the two groups, as the p values > 0.05, which shows that both the groups are homogenous in terms of all the socio-demographic characteristics among postnatal mothers in both the dry heat and moist heat group.

Regarding age in dry heat group, majority 16 (53.3%) of postnatal mothers belonged to the age group of 20-25 years whereas in the moist heat group majority of mothers 20 (66.7%) belonged to the age group of 20-25 years .

With regard to education in dry heat group, majority of the postnatal mothers 14(46.7%) were graduates .In moist heat group, majority of the postnatal mothers 14(46.7%) were also graduates .

Regarding occupation in dry heat group, majority of the postnatal mothers 22(73.3%) were unemployed .In moist heat group, majority of the postnatal mothers 22 (73.3%) were unemployed .

Regarding dietary pattern in the dry heat group ,majority of the postnatal mothers 20(66.7%) were vegetarians whereas in the moist heat group 19 (63.3%) of the postnatal mothers were vegetarians.

Regarding type of family in the dry heat group ,majority of the postnatal mothers 18(60.0%) belonged to a nuclear family .In the moist heat group ,majority of the postnatal mothers 19(63.3%) belonged to a nuclear family .

Section-IB

Findings related to the clinical variables among the postnatal mothers in the dry heat and moist heat group.

Table-6: Frequency, percentage distribution and homogeneity of clinical variables among the post natal mothers regarding episiotomy pain perception and wound healing in both Dry heat and Moist heat group

N=60

Clinical variables		Group				Chi-square/ Fisher's exact test statistic	p value
		Dry heat (n=30)		**Moist heat (n=30)**			
		Frequency	%	Frequency	%		
Body mass index (BMI)	<18.5	0	0.0%	2	6.7%	2.748*	0.432
	18.5-24.9	18	60.0%	14	46.7%		
	25-29	10	33.3%	11	36.7%		
	30-34.9	2	6.7%	3	10.0%		
Parity	Primi	20	66.7%	20	66.7%	0.001	0.999
	Multi	10	33.3%	10	33.3%		
Received any perineal exercise?	Yes	3	10.0%	1	3.3%	1.071*	0.301
	No	27	90.0%	29	96.7%		
Currently receiving any analgesic?	Yes	30	100.0%	30	100.0%	0.34*	0.84
	No	0	0.00%	0	0.00%		
History of any present illness?	Diabetes mellitus	3	10.0%	3	10.0%	0.353*	0.838
	Hypertension	2	6.7%	1	3.3%		
	Bronchial asthma	0	0.00%	0	0.00%		
	Normal condition	25	83.3%	26	86.7%		
Birth weight of baby	Below 2.5kg	3	10.0%	3	10.0%	0.491*	0.782
	2.5kg-3.5kg	21	70.0%	23	76.7%		
	Above 3.5kg	6	20.0%	4	13.3%		
Type of medio-lateral episiotomy	Right	30	100.0%	30	100.0%	0.34*	0.84
	Left	0	0.00%	0	0.00%		

* indicates Fisher's exact test result.

From Table 6 results, it is revealed that all the socio-demographic and clinical variables are homogeneously distributed across the two groups, indicated by p values > 0.05.

This shows that both the groups are homogenous in terms of all the clinical characteristics among postnatal mothers in both the dry heat and moist heat group.

Regarding BMI in the dry heat group, majority of the postnatal mothers18 (60%) had BMI in the range of 18.5-24.9 .

In the moist heat group, majority of the postnatal mothers 14(46.7%) had BMI in the range of 18.5-24.9 .

Regarding parity in the dry heat group, majority of the postnatal mothers 20(66.7%) were primiparas whereas in the moist heat group, 20(66.7%) were primiparas .

Regarding receiving any type of perineal exercise training in the dry heat group, majority of the postnatal mothers 27(90.0%) did not receive any specific type of perineal exercise during their antenatal period .In the moist heat group, majority of the postnatal mothers (96.7%) did not receive any specific type of perineal exercise during their antenatal period.

Regarding the mother currently receiving any analgesic in the dry heat group, majority of the postnatal mothers 30(100.0%) were receiving analgesics and also in the moist heat group (100.0%) all of them were on analgesics.

Regarding history of any present illness in the dry heat group, majority of the postnatal mothers 25(83.3%) had normal condition .In the moist heat group, majority of the postnatal mothers had 26(86.7%) had normal condition .

Regarding birth weight of baby in the dry heat group, majority of the postnatal mothers 21(70%)delivered babies having birth weight between 2.5-3.5kg .In the moist heat group, majority of the postnatal mothers 23(76.7 %)delivered babies having birth weight between 2.5-3.5kg .

Regarding the type of medio-lateral episiotomy performed in the dry heat group, majority of the postnatal mothers 30(100.0%) had right medio-lateral episiotomy and in the moist heat group also all of them i.e 100% had right medio-lateral episiotomy .

Section- II

Findings related to the assessment of pre-interventional and post-interventional episiotomy wound healing and painperception among the postnatal mothers in the dry heat and moist heat group.

To assess the pre and post interventional episiotomy wound healing and pain perception, the normality of pre and post scores were tested using the Shapiro-Wilk test. Since the normality assumption is violated, median and interquartile range (Q3-Q1) was used.

Table 7: Pre and post intervention pain perception and wound healing summarised using Median and IQR for Dry and Moist heat groups

The pre and post scores of pain and wound healing are assessed as Median and IQR in the Dry heat and Moist heat groups

N=30+30

	Dry heat (n=30)				**Moist heat (n=30)**			
	Median	Q1	Q3	IQR	Median	Q1	Q3	IQR
Pre - Pain	5	5	6	1	5	5	6	1
Post - Pain	2	2	2	0	2	2	3	1
Pre – Wound healing	6	5	7	2	6	5	7	2
Post – Wound healing	2	2	3	1	3	2	3	1

The table depicts that before intervention the median of pain perception score was 5 in Dry heat and Moist heat group and reduced to 2 , post intervention in both the groups. The pre and post scores of pain and wound healing are assessed as Median and IQR in the Dry heat and Moist heat groups as the data is not normally distributed.

Before the intervention the median of wound healing score was 6 in Dry heat and Moist heat group and reduced to 2 and 3, respectively, post intervention.

This shows that a significant difference was observed in the pre test and post test scores of pain perception and wound healing among postnatal mothers in the dry heat and moist heat group.

Section-III

Comparison of the effectiveness of dry heat versus moist heat on episiotomy wound healing and pain perception among postnatal mothers.

Testing of hypothesis

To find out significance difference in the effect of dry heat and moist heat on episiotomy wound healing and pain perception among postnatal mothers, the following null hypothesis and alternate hypothesis was framed at 0.05 level of significance.

1) Comparison of post intervention episiotomy wound healing scores between dry and moist heat among postnatal mothers

Table 8: Comparison of post intervention episiotomy wound healing scores between dry and moist heat among postnatal mothers

N=60

Variable	Group	n	Median	Q1, Q3 (IQR)	Mann-Whitney U	p value
Post wound healing	Dry heat (n=30)	30	2	2,3 (1)	242.00	<0.001 (S)
	Moist heat (n=30)	30	3	2,3 (1)		

S=Statistically significant

The results of Mann-Whitney U test provided in Table 8 reveals that a statistically significant difference exists in the post intervention score of wound healing between dry and moist heat groups ($p<0.001$). This test was used because the post- interventional wound healing score does not follow normal distribution in both dry and moist healing groups.

It depicts that that median score of wound healing was low in dry heat compared to moist heat after the intervention. Hence, even though both the interventions were effective but dry heat was better than moist heat in terms of reducing the pain level and improving the wound healing status of postnatal mothers. Therefore, we reject the null hypothesis and accept the research hypothesis.

2) Comparison of post-intervention episiotomy pain perception scores between dry and moist heat among postnatal mothers

Table 9: Comparison of post-intervention episiotomy pain perception scores between dry and moist heat among postnatal mothers

N=60

Variable	Group	n	Median	Q1, Q3 (IQR)	Mann-Whitney U	p value
Post pain perception	Dry heat (n=30)	30	2	2,2 (0)	442.00	0.897 (NS)
	Moist heat (n=30)	30	2	2,3 (1)		

NS=Not Statistically significant

The results of Mann-Whitney U test provided in Table 9 reveals that a statistically significant difference does not exist in the post intervention score of pain between dry and moist heat groups as the p value is >0.05 (p=0.897). This test was used because the post-intervention pain score does not follow normal distribution in both dry and moist healing groups

From Table 9 ,we can also infer that median score of pain perception is same in both dry heat and moist heat groups, therefore both dry heat and moist heat were effective in reducing the level of pain among postnatal mothers. Therefore, here we partly accept the null hypothesis .

Section-D

Association between the post- test level of episiotomy wound healing and pain perception among postnatal mothers in dry heat and moist heat group with their selected demographic variables and clinical variables.

To determine association between socio-demographic variables and post intervention wound healing score in dry heat group, Mann-Whitney U test was used.

Table 10: Association between socio-demographic variables and post-test episiotomy wound healing scores in Dry heat group

n=60

Category	**Dry heat group (n=30)**	n	Post Wound healing score		Mann-Whitney U test statistic	p value
			Median	Q1, Q3 (IQR)		
Age	15-19	0	-	-	81.00	0.765
	20-25	22	2	2,3(1)		
	26-30	7	2	2,3(1)		
	>30	1	2	2,3(1)		
Education (Kuppuswamy scale)	Professional degree	2	2	2,3(1)	107.50	0.854
	Graduate	14	2	2,3(1)		
	Diploma	1	2	2,3(1)		
	High school	10	2	2,3(1)		
	Middle school	0	-	-		
	Primary school	2	2	2,3(1)		
	Illiterate	2	2	2,3(1)		
Occupation (Kuppuswamy scale)	Professional	1	2	2,3(1)	84.50	0.872
	Semi-professional	4	2	2,3(1)		
	Clerical/shop/farmer	1	2	2,3(1)		
	Skilled worker	2	2	2,3(1)		
	Semi-skilled worker	0	2	-		
	Unskilled worker	0	2	-		
	Unemployed	22	2	2,3(1)		
Type of family	Nuclear	18	2	2,3(1)	105.00	0.917
	Joint	9	2	2,3(1)		
	Extended	3	2	2,3(1)		
Dietary pattern	Vegetarian	20	2	2,3(1)	96.00	0.880
	Non-vegetarian	10	2	2,3(1)		

The results from Table 10, reveals that since the p value is >0.05 none of the socio-demographic variables are associated with post-test wound healing scores in the dry heat group.

This test was used because each socio-demographic variable has two levels and wound healing score is not normally distributed variable.

Table 11: Association between socio-demographic variables and post -test episiotomy pain perception scores in Dry heat group

n=60

Category	**Dry heat group (n=30)**	n	Median	Q1, Q3 (IQR)	Mann-Whitney U	p value
Age	15-19	0	-	-	72.50	0.475
	20-25	22	2	2,2(0)		
	26-30	7	2	2,3(1)		
	>30	1	2	2,2(0)		
Education (Kuppuswamy scale)	Professional degree	2	2	2,3(1)	104.00	0.759
	Graduate	14	2	2,2(0)		
	Diploma	1	2	2,3(1)		
	High school	10	2	2,3(1)		
	Middle school	0	-	-		
	Primary school	2	2	2,3(1)		
	Illiterate	2	2	2,3(1)		
Occupation (Kuppuswamy scale)	Professional	1	2	2,3(1)	80.50	0.730
	Semi-professional	4	2	2,2(0)		
	Clerical/shop/farmer	1	2	2,3(1)		
	Skilled worker	2	2	2,3(1)		
	Semi-skilled worker	0	-	-		
	Unskilled worker	0	-	-		
	Unemployed	22	2	2,3(1)		
Type of family	Nuclear	18	2	2,2(0)	91.00	0.491
	Joint Extended	9	2	2,3(1)		
	Extended	3	2	2,3(1)		
Dietary pattern	Vegetarian	20	2	2,3(1)	72.00	0.231
	Non-vegetarian	10	2	1,2(1)		

The results from Table 11, reveals that since the p value >0.05 ,none of the socio-demographic variables are associated with post pain scores in the dry heat group.

Table 12: Association between socio-demographic variables and post-test episiotomy wound healing in Moist heat group

n=60

Category	**Moist heat group (n=30)**	n	Median	Q1, Q3 (IQR)	Mann-Whitney U	p value
Age	15-19	0	-	-	61.50	0.957
	20-25	20	3	3,3(0)		
	26-30	5	3	2,3(1)		
	>30	5	3	2,3(1)		
Education (Kuppuswamy scale)	Professional degree	0	-	-	101.00	0.667
	Graduate	14	3	2,3(1)		
	Diploma	0	3	3,3(0)		
	High school	10	3	3,3(0)		
	Middle school	0	-	-		
	Primary school	3	3	2,3(1)		
	Illiterate	3	3	2,3(1)		
Occupation (Kuppuswamy scale)	Professional	2	3	2,3(1)	67.00	0.344
	Semi-professional	0	-	-		
	Clerical/shop/farmer	3	3	2,3(1)		
	Skilled worker	2	3	2,3(1)		
	Semi-skilled worker	0	-	-		
	Unskilled worker	1	3	2,3(1)		
	Unemployed	22	3	2,3(1)		
Type of family	Nuclear	19	3	3,3(0)	78.50	0.268
	Joint	9	3	2,3(1)		
	Extended	2	3	2,3(1)		
Dietary pattern	Vegetarian	19	3	2,3(1)	99.50	0.832
	Non-vegetarian	11	3	3,3(0)		

The results from Table 12, reveals that since the p value is >0.05, none of the socio-demographic variables are associated with wound healing post scores in the moist heat group.

Table 13: Association between socio-demographic variables and post-test episiotomy pain perception scores in Moist heat group

n=60

Category	**Moist heat group (n=30)**	n	Median	Q1, Q3 (IQR)	Mann-Whitney U	p value
Age	15-19	0	-	-	21.50	0.019
	20-25	20	3	3,3(0)		
	26-30	5	2	2,3(1)		
	>30	5	2	2,3(1)		
Education (Kuppuswamy scale)	Professional degree	0	-	-	67.50	0.064
	Graduate	14	2	1,2(1)		
	Diploma	0	-	-		
	High school	10	2	1,2(1)		
	Middle school	0	-	-		
	Primary school	3	2	2,3(1)		
	Illiterate	3	2	2,3(1)		
Occupation (Kuppuswamy scale)	Professional	2	2	2,3(1)	82.00	0.801
	Semi-professional	0	-	-		
	Clerical/shop/farmer	3	2	2,3(1)		
	Skilled worker	2	2	2,3(1)		
	Semi-skilled worker	0	-	-		
	Unskilled worker	1	2	2,3(1)		
	Unemployed	22	2	2,3(1)		
Type of family	Nuclear	19	2	1,2(1)	68.50	0.123
	Joint	9	2	2,3(1)		
	Extended	2	2	2,3(1)		
Dietary pattern	Vegetarian	19	2	2,3(1)	96.50	0.735
	Non-vegetarian	11	2	1,3(2)		

The results from Table 13, reveals that only age is associated with post pain scores in Moist heat group ($p=0.019$) and since the p value is >0.05 rest other socio-demographic variables are not associated with post-test pain perception scores in the moist heat group.

Association between clinical variables and post intervention episiotomy wound healing score in Dry heat group

To determine association between clinical variables and post -test wound healing scores in Dry heat group, Mann-Whitney U test was used for Parity and Perineal exercise, as these variables have two levels and the rest of the variables were analysed using Kruskal-Wallis test as they have more than 2 levels. Wound healing score is not non-normally distributed variable.

Table 14: Association between clinical variables and post-test episiotomy wound healing scores in Dry heat group

n=60

Category	**Dry heat group (n=30)**	n	Post-test wound healing score		Mann-Whitney U or Kruskal-Wallis test statistic	p value
			Median	Q1, Q3 (IQR)		
BMI	<18.5	-	-	-	1.670	0.434
	18.5-24.9	18	2	2,2(0)		
	25-29	10	2	2,3(1)		
	30-34.9	2	3	2,3(1)		
Parity	Primi	20	2	2,3(1)	96.00	0.880
	Multi	10	2	2,3(1)		
Received any perineal exercise?	Yes	3	2	2,2(0)	33.00	0.647
	No	27	2	2,3(1)		
Any history of present illness?	Asthma	-	-	-	2.511	0.285
	DM	3	3	2,3(1)		
	HTN	2	3	2,3(1)		
	Normal	25	2	2,2(0)		
Birth weight of baby	Below 2.5kg	3	2	1,3(2)	0.192	0.909
	2.5kg-3.5kg	21	2	2,3(1)		
	Above	6	2	2,3(1)		

	3.5kg					
Currently receiving any analgesic?	Yes	30	-	-	-	-
	No	0				
Type of medio-lateral episiotomy	Right	30	-	-	-	-
	Left	0				

The results from Table 14, reveals that none of the clinical variables are associated with post-test wound healing scores in the dry heat group as the p value >0.05.

Association between clinical variables and post intervention episiotomy pain score in Dry heat group

To determine association between clinical variables and post intervention pain score in dry heat group, Mann-Whitney U test was used for Parity and Perineal_exercise, as these variables have two levels and the rest of the variables were analysed using Kruskal-Wallis test as they have more than 2 levels. Pain perception score is not non-normally distributed variable.

Table 15: Association between clinical variables and post-test pain perception scores in Dry heat group

n=60

Category	**Dry heat group (n=30)**	n	Post -test pain score		Mann-Whitney U or Kruskal-Wallis test statistic	p value
			Median	Q1, Q3 (IQR)		
BMI	<18.5	0	-	-		
	18.5-24.9	18	2	1,2(1)	0.787	0.675
	25-29	10	2	2,3(1)		
	30-34.9	2	2	2,2(0)		
Parity	Primi	20	2	2,3(1)	96.00	0.880
	Multi	10	2	2,2(0)		

Received any perineal exercise?	Yes	3	2	2,3(1)	33.00	0.647

Any history of present illness?	DM	3	2	2,2(0)	0.024	0.988
	HTN	2	2	2,2(0)		
	Normal	25	2	2,3(1)		
Birth weight of baby	Below 2.5kg	3	2	2,2(0)	0.771	0.680
	2.5kg-3.5kg	21	2	2,2(0)		
	Above 3.5kg	6	2	1,3(2)		
Receiving any analgesic?	Yes	30	-	-	-	-
	No	0				
Type of medio-lateral episiotomy	Right	30	-	-	-	-
	Left	0				

The results from Table 15, reveals that none of the clinical variables are associated with post -test pain scores in the dry heat group as the p value >0.05

Association between clinical variables and post intervention wound healing score in Moist heat group

To determine association between clinical variables and post intervention wound healing score in moist heat group, Mann-Whitney U test was used for Parity and Perineal_exercise, as these variables have two levels and the rest of the variables were analysed using Kruskal-Wallis test as they have more than 2 levels. Wound healing score is not non-normally distributed variable.

Table 16: Association between clinical variables and episiotomy wound healing post scores in Moist heat group

n=60

Category	Moist heat group **(n=30)**	n	Post -test wound healing score		Mann-Whitney U or Kruskal-Wallis test statistic	p value
			Median	Q1, Q3 (IQR)		
BMI	<18.5	2	3	2,3(1)	2.689	0.442
	18.5-24.9	14	3	2,3(1)		
	25-29	11	3	3,3(0)		
	30-34.9	3	3	2,3(1)		
Parity	Primi	20	3	2,3(1)	87.00	0.588
	Multi	10	3	3,3(0)		
Received any perineal exercise?	Yes	1	4	4,4(0)	0.50	0.067
	No	29	3	2,3(1)		
Any history of present illness?	Asthma	0	-	-	7.3657	0.022
	DM	3	2	2,2(0)		
	HTN	1	3	3,3(0)		
	Normal	26	3	3,3(0)		
Birth weight of baby	Below 2.5kg	3	3	2,3(1)	0.875	0.646
	2.5kg-3.5kg	23	3	2,3(1)		
	above 3.5kg	4	3	3,3(0)		
Receiving any analgesic?	Yes	30	-	-	-	-
	No	0				
Type of medio-lateral episiotomy	Right	30	-	-	-	-
	Left	0				

The results from Table 16, reveals that 'History of present' illness is associated with wound healing post scores in Moist heat group (p=0.022). Since the p value is >0.05 rest other socio-demographic variables are not associated with post-test pain perception scores in the moist heat group.

Association between clinical variables and post intervention episiotomy pain score in Moist heat group

To determine association between clinical variables and post intervention pain score in Moist heat group, Mann-Whitney U test was used for Gravida and Perineal_exercise, as these variables have two levels and the rest of the variables were analysed using Kruskal-Wallis test as they have more than 2 levels. Pain perception score is not non-normally distributed variable.

Table 17: Association between clinical variables and episiotomy pain post scores in Moist heat group

n=60

Category	Moist heat group **(n=30)**	n	Post-test pain score		Mann-Whitney U or Kruskal-Wallis test statistic	p value
			Median	Q1, Q3 (IQR)		
BMI	<18.5	2	3	2,3(1)	5.183	0.159
	18.5-24.9	14	3	2,3(1)		
	25-29	11	3	3,3(0)		
	30-34.9	3	3	2,3(1)		
Parity	Primi	20	3	2,3(1)	92.00	0.746
	Multi	10	3	3,3(0)		
Received any perineal exercise?	Yes	1	4	4,4(0)	13.50	0.933
	No	29	3	2,3(1)		
Any history of present illness?	Asthma	-	-	-	3.00	0.083
	DM	3	2	2,2(0)		
	HTN	1	3	3,3(0)		
	Normal	26	3	3,3(0)		
Birth weight of baby	Below 2.5kg	3	3	2,3(1)	4.173	0.124
	2.5kg-3.5kg	23	3	2,3(1)		
	Above 3.5kg	4	3	3,3(0)		

Receiving any analgesic?	Yes	30	-	-	-	-
	No	0				
Type of medio-lateral episiotomy	Right	30	-	-	-	-
	Left	0				

The results from Table 17, reveals that as the p value is >0.05 ,therefore ,no significant association was found between the clinical variables and the post-test episiotomy pain perception scores.

Therefore, we

Chapter summary

This chapter dealt with the analysis and interpretation of the study results and findings.

CHAPTER V

DISCUSSION

DISCUSSION

This chapter deals with the discussion of the results of data analyzed based on the objectives and hypotheses of the study. The purpose of the study was to assess the effectiveness of dry heat versus moist heat application on episiotomy wound healing and pain perception among postnatal mothers at AIIMS Bhopal. 60 samples were selected by convenient sampling technique and were divided into dry heat group (30 postnatal mothers) and moist heat group (30 postnatal mothers). Pre-test was conducted before the intervention .Infrared radiation and warm compression was given by the investigator to the mothers for three consecutive days .The intervention protocol included 20 minutes for infra red radiation and warm compression twice daily. Post-test was conducted after 3 days of intervention.
The discussion is based on the objectives and the hypothesis specified in the study.

Major findings of the study -

Distribution of socio-demographic and clinical variables

- Regarding age in dry heat group, majority 16 (53.3%) of postnatal mothers belonged to the age group of 20-25 years whereas in the moist heat group majority of mothers 20(66.7%) belonged to the age group of 20-25 years .
- With regard to education in dry heat group, majority of the postnatal mothers 14(46.7%) were graduates .In moist heat group, majority of the postnatal mothers 14(46.7%) were also graduates .

- Regarding occupation in dry heat group, majority of the postnatal mothers 22(73.3%) were unemployed .In moist heat group, majority of the postnatal mothers 22(73.3%) were also unemployed .
- Regarding dietary pattern in the dry heat group ,majority of the postnatal mothers 20(66.7%) were vegetarians whereas in the moist heat group 19(63.3%) of the postnatal mothers were vegetarians .
- Regarding type of family in the dry heat group ,majority of the postnatal mothers 18(60.0%) belonged to a nuclear family .In the moist heat group also ,majority of the postnatal mothers 19(63.3%) belonged to a nuclear family .
- Regarding BMI in the dry heat group, majority of the postnatal mothers 18(60%) had BMI in the range of 18.5-24.9 .In the moist heat group also, majority of the postnatal mothers 14(46.7%) had BMI in the range of 18.5-24.9 .
- Regarding parity in the dry heat group, majority of the postnatal mothers 20(66.7%) were primiparas and in the moist heat group also, majority of the mothers 20(66.7%) were primiparas .
- Regarding receiving any type of perineal exercise training in the dry heat group, majority of the postnatal mothers 20(90.0%) did not receive any specific type of perineal exercise during their antenatal period .In the moist heat group also, majority of the postnatal mothers 29(96.7%) did not receive any specific type of perineal exercise during their antenatal period.
- Regarding the mother currently receiving any analgesic in the dry heat group, majority of the postnatal mothers 30(100.0%) were receiving analgesics and also in the moist heat group 30(100.0%) all of them were on analgesics.

- Regarding history of any present illness in the dry heat group, majority of the postnatal mothers 25(83.3%) had normal condition .In the moist heat group, majority of the postnatal mothers also had 26 (86.7%) had normal condition
- Regarding birth weight of baby in the dry heat group, majority of the postnatal mothers 21(70%)delivered babies having birth weight between 2.5-3.5kg.In the moist heat group also, majority of the postnatal mothers 23(76.7 %)delivered babies having birth weight between 2.5-3.5kg .
- Regarding the type of medio-lateral episiotomy performed in the dry heat group, majority of the postnatal mothers 30(100.0%) had right medio-lateral episiotomy and in the moist heat group also all of them i.e 30 (100%) had right medio-lateral episiotomy .

Pre and post intervention pain perception and wound healing scores using Median and IQR for Dry and Moist heat groups

Before intervention the median of pain perception score was 5 in Dry heat and Moist heat group and reduced to 2 , post intervention in both the groups.Before the intervention the median of wound healing score was 6 in Dry heat and Moist heat group and reduced to 2 and 3, respectively, post intervention.Therefore, we can say that there was a significant improvement in the episiotomy wound healing and reduction in pain scores after the intervention in both the dry heat and moist heat group.

Comparison of the effectiveness of dry heat versus moist heat on episiotomy wound healing and pain perception among postnatal mothers.

1) Comparison of post intervention episiotomy wound healing scores between dry and moist heat among postnatal mothers

The results of Mann-Whitney U test reveals that a statistically significant difference exists in the post intervention score of wound healing between dry and moist heat groups ($p<0.001$). The median score of wound healing is low in dry heat compared to moist heat. Hence, dry heat is better than moist heat in terms of reducing the pain level and improving the wound healing status of postnatal mothers. Therefore, we reject the null hypothesis and accept the research hypothesis.

2) Comparison of post-intervention episiotomy pain perception scores between dry and moist heat among postnatal mothers

The results of Mann-Whitney U test provided reveals that a statistically significant difference does not exist in the post intervention score of pain between dry and moist heat groups as the p value is >0.05 ($p=0.897$),The median score of pain perception is same in both dry heat and moist heat groups, therefore both dry heat and moist heat were effective in reducing the level of pain among postnatal mothers. Therefore, we partly reject the null hypothesis partly accept it.

Association between the post- test level of episiotomy wound healing and pain perception among postnatal mothers in dry heat and moist heat group with their selected demographic variables and clinical variables.

In socio-demographic variables, age is associated with post pain scores in Moist heat group (p=0.019).None of the socio-demographic variables are associated with post pain scores in the dry heat group. In clinical variables, 'History of present' illness is associated with wound healing post scores in Moist heat group (p=0.022).All the other socio-demographic variables were found to have no significant association with the post -intervention pain scores in the dry heat and moist heat group.

Discussion

The findings of the present study as per the research objectives are discussed and delineated under the following sections.

1. Sociodemographic and clinical characteristics of the postnatal mothers
2. Pre and post intervention episiotomy pain perception and wound healing scores among postnatal mothers in dry and moist heat groups
3. Comparison of the effectiveness of dry heat versus moist heat on episiotomy wound healing and pain perception among postnatal mothers.
4. Association between the post- test level of episiotomy wound healing and pain perception among postnatal mothers in dry heat and moist heat group with their selected demographic variables and clinical variables.

1. Socio-demographic and clinical characteristics of the postnatal mothers

- Regarding age ,majority of postnatal mothers belonged to the age group of 20-25 years in both the dry heat (53.3%) and moist heat group (66.7%). A similar study supported by Angelin Sheeba (2019) in Chennai , revealed that majority of the postnatal mothers (47.50%) in dry heat group and 40.00% of the mothers in the moist heat group were between the age Group of 21 to 25 years.[95]Another study supported by A Saranya (2019) in Madurai ,revealed that in the dry heat group, majority of the mothers (63.33%) were in the age between 20 – 25 years, in moist heat group, majority of the mothers (46.66%) were in the age between 20 –

25 years.[96] A similar study conducted by Hoda Abed El-Azim Mohamed (2012) in Egypt showed that the mean age in the experimental and control groups (21.8 and 22.2 years) respectively.[96]

- In the present study ,majority of the postnatal mothers were graduates in the dry heat (46.7%)and the moist heat group(46.7%).In a similar study conducted by Bairavi, M (2015) in Thanjavur reported that 63.3% in the experimental group and 56.6% in the control group were graduates.[98] A contradictory study conducted by Shamlin Ninsha, S (2012) in Tirupur, the findings indicated that in experimental group, majority (37%) of the mothers were in primary education. In control group majority (47%) of mothers were in higher secondary school education.[99]
- In the present study, majority of the postnatal mothers (73.3%) were unemployed in both the moist heat and dry heat group. A similar study conducted by Nemat Ismail (2019) in Egypt ,showed that majority of the postnatal mothers around two thirds of the samples in both groups were house wives i.e unemployed .[100] A similar study conducted by Angelin Sheeba (2019) in Chennai ,revealed that majority of the postnatal mothers (35%) were unemployed in moist heat and (25.0%)in the dry heat group.[101]
- In the present study ,majority of the postnatal mothers in the dry heat group (66.7%) and (63.3%) in the moist heat group were vegetarians .A contradictory study conducted by Mable Vinolia, E (2018) in Trichy ,showed that majority of the postnatal mothers (93.3%) in experimental group1 whereas in experimental group-2, (86.7%) were non-vegetarians.[102]

- In the present study, majority of the postnatal mothers in the dry heat group (60.0%) and (63.3%)in the moist heat group belonged to a nuclear family. A similar study conducted by Angelin Sheeba (2019) in Chennai supported that majority of the postnatal mothers (65.00%) in dry heat group and 57.50% of the mothers in moist heat group were living in nuclear family.[103]A similar study conducted by Shamlin Ninsha S (2012) in Tirupur, showed that the majority of the postnatal mothers (57.00%) in the experimental group and (63.0%)in the control group were living in nuclear family.[104]
- In the present study majority of the postnatal mothers (60%) in the dry heat group and (46.7%) in the moist heat group had BMI in the range of 18.5-24.9 .A similar study conducted by Mable Vinolia, E (2018) in Trichy ,showed that majority of the postnatal mothers (36.6%)in the experimental group 1 and (73.3%) in the experimental group 2 had BMI in the range of 18.5-24.9.[105] A contradictory study conducted by Bairavi, M (2015) in Thanjavur, showed that majority of the postnatal mothers in the experimental group (26.6%)and (33.3%) in the control group had BMI in the range of 25.0-29.9.[106]

- In the present study, majority of the postnatal mothers (66.7%) were primiparas in the moist heat and dry heat group. A similar study conducted by Bairavi, M (2015) in Thanjavur reported that majority of the postnatal mothers (70.0%) in the experimental group and (60.0%)in the control group were primiparas. [107] A study supported by the findings of Angelin Sheeba (2019) in Chennai, reported that majority of the postnatal mothers (80.00%) in dry heat, and (70.00%) in

moist heat were primiparas.[108]

- In the present study, majority of the postnatal mothers in the dry heat group and moist heat group i.e. (100.0%) were receiving analgesics .In a similar study conducted by Hoda Abed El-Azim Mohamed (2012) in Egypt showed that majority of the postnatal mothers (70.0%) in the experimental group and (100%)control group were on analgesics after delivery.[109]
- In the present study, majority of the postnatal mothers in the dry heat group (83.3%) and (86.7%) in the moist heat group had normal condition .In a similar study conducted by Bairavi, M (2015) in Thanjavur reported that majority of the postnatal mothers in the experimental group (83.3%) and (80.0%) in the control group had normal condition.[110]
- In the present study, majority of the postnatal mothers in the dry heat group (70.0%) and moist heat group (76.7%) delivered babies having birth weight between 2.5-3.5kg .In a similar study conducted by Mable Vinolia, E (2018) in Trichy, the findings showed that the experimental group-1 (40.0%) and experimental group 2 (46.7%) delivered babies having birth weight between 2.5-3.5kg [111].A contradictory study conducted by Angelin Sheeba (2019) in Chennai, indicated that majority of the postnatal mothers delivered babies having weight less than 2.5-3.0kg in both the dry heat(72.5%)and moist heat group (70.0%).[112]

- In the present study, majority of the postnatal mothers in the dry heat group and moist heat group had medio-lateral episiotomy performed in the dry heat group, majority of the postnatal mothers (100.0%) had right medio-lateral episiotomy and in the moist heat group also all of them i.e 100% had right medio-lateral episiotomy . In a similar study conducted by Bairavi, M (2015) in Thanjavur reported that majority of the postnatal mothers in the experimental group (76.6%) and (83.3%) in the control group had right medio-lateral episiotomy .[19] In a similar study conducted by Angelin Sheeba (2019) in Chennai, reported that majority of the postnatal mothers in the dry heat group (95.0%) and (92.5%) in the moist heat group had right medio-lateral episiotomy .[113]

2.Pre and post intervention episiotomy wound healing and pain perception among postnatal mothers in dry and moist heat groups

Before intervention the median of pain perception score was 5 in Dry heat and Moist heat group and reduced to 2 , post intervention in both the groups. Before the intervention the median of wound healing score was 6 in Dry heat and Moist heat group and reduced to 2 and 3, respectively, post intervention which shows effectiveness of dry heat and moist heat on episiotomy wound healing and pain perception among postnatal mothers.

- In a similar study conducted by Angelin Sheeba (2019) in Chennai, the findings indicated that in the pre- test the percentage of mean score was 80.30%, whereas the post- test the percentage of mean score was 31.80%. The total mean reduction is difference is 3.51 and the percentage of mean reduction score was 35.10% using Numerical pain scale in the moist heat group. In the pre- test the percentage of mean score was 75.00% , whereas in the post - test the percentage of mean score was 31.00%. The total percentage of mean reduction score was 40.60% using present pain intensity in the dry heat group. [114]The present study findings are consistent with the findings reported by A Saranya (2019) in Madurai, which revealed that the pre-test mean score of episiotomy wound healing was 6.73 in the dry heat group and 6.63 in the moist heat group which reduced to 2.17 in the dry heat group and 3.73 in the moist heat group.[115]The current study findings are in line with the findings of a study conducted by Nemat Ismail (2019) in Egypt, which reported that the pre-test pain scores were 8.4 and 8.1 in the dry heat group and moist heat group respectively and the post-test scores reduced to 1.9 and 7.6 in the dry heat and moist heat group respectively.[116]In a study conducted by Nagla Zaki et al (2023) the findings reported that the episiotomy wound healing scores were 2.34 and 6.24 before the intervention which reduced to 0.84 and 3.32 after the intervention in the dry heat and moist heat group respectively.[117]

Comparison of the effectiveness of dry heat versus moist heat on episiotomy wound healing and pain perception among postnatal mothers.

1) Comparison of post intervention episiotomy wound healing scores between dry and moist heat among postnatal mothers

The results of Mann-Whitney U test reveals that a statistically significant difference exists in the post intervention score of wound healing between dry and moist heat groups ($p<0.001$). The median score of wound healing is low in dry heat compared to moist heat. Hence, dry heat is better than moist heat in terms of reducing the pain level and improving the wound healing status of postnatal mothers.

- The current study findings are analogous with the study findings carried out by Angelin Sheeba (2019) in Chennai, which reported that the pre-test pain scores in the dry heat group was 8.03 and 3.50 score in the post-test, the difference is 4.53, this difference is large and it is significant. It was tested using Student paired t-test. t=16.31P=0.001***(S) shows it is very highly significant.[118]Similar results were obtained by Navdeep Kaur et al., (2013)in Ludhiana who conducted a study aimed to assess the effect of dry heat versus moist heat on episiotomy pain and wound healing in PGIMER, Chandigarh. Though both the interventions were effective but dry heat was more effective than moist heat in relieving pain and improving wound healing at the episiotomy site.[119]In addition, this finding is in accordance with Khosla P et al (2017) who concluded that the dry heat has a more long-lasting effect on episiotomy wound healing and reduction of pain than without any

intervention. [120]In addition ,the study of Nethravathi et al (2015) revealed that there was a significant improvement in wound healing in experimental group as compared to control group. This study concluded that infra red lamp therapy is an effective method of treatment on healing of episiotomy wound among post natal mothers. [121]The present findings are in line with that of El-Lassy and Madian (2019) who concluded that postnatal mothers who applied infrared lamp therapy on episiotomy wound site had faster wound healing than those who had normal routine care.[122]

Unlikely, different findings were reported by Chandraleka et al (2019) who found that even though both sitz bath and infrared ray therapy was effective in improvement of wound healing of episiotomy among the postnatal mothers, sitz bath was more effective in improving wound healing among the postnatal mothers.[123]

2) Comparison of post-intervention episiotomy pain perception scores between dry and moist heat among postnatal mothers

The results of Mann-Whitney U test provided reveals that a statistically significant difference does not exist in the post intervention score of pain between dry and moist heat groups as the p value is >0.05 (p=0.897),The median score of pain perception is same in both dry heat and moist heat groups, therefore both dry heat and moist heat were effective in reducing the level of pain among postnatal mothers.

- On the contrary, in a study conducted by Chandraleka et al (2023) in Puducherry indicated that sitz bath is more effective in reducing the level of episiotomy pain among postnatal mothers. They ascribed the pain alleviation to the warm water sitz bath's calming properties, which prevent genital itching and perineal irritation. It also avoids soreness and burning sensations around the perineum, which aids in minimizing pain, itching, and discomfort.[124]The present study's findings also contradict Huang et al who investigated the effect of far-infrared radiation on perineal wound pain and sexual function in primiparous women undergoing an episiotomy. The study revealed that there was no significant difference between the intervention and comparison groups regarding the perineal pain intensity immediately after delivery, one week, or six weeks postpartum.[125]In addition, Kalaivani, found that the application of the sitz bath was more effective in the experimental group than in the control group. He concluded that the application of the sitz bath is effective in the healing of episiotomy wound. [33]Surprisingly, Girsang and Elfira revealed that the cold sitz bath hydrotherapy had a significantly improved effect in reducing perineal pain than the infrared heat application among postnatal mothers.[34] George (2013) also concluded that both sitz bath and infrared therapy were found to have same effect on episiotomy wound healing among the postnatal mothers.[126]

Association between the post- test level of episiotomy wound healing and pain perception among postnatal mothers in dry heat and moist heat group with their selected demographic variables and clinical variables.

In the socio-demographic variables, age is associated with post-test pain scores in moist heat group (p=0.019).None of the socio-demographic variables were associated with post -test pain scores in the dry heat group. In clinical variables, 'History of present' illness was associated with wound healing post scores in moist heat group (p=0.022).

- The similar findings are analogous with the study conducted by Poonam Sheoran et al(2016) in Chandigarh which aimed to compare the effectiveness of infra red light therapy vs. sitz bath on episiotomy in terms of episiotomy wound healing among postnatal mothers. The study reveals that no significant association was found between episiotomy wound healing of the postnatal mothers in the dry heat and moist heat group with their selected demographic variables. [127]In a similar study conducted by A Saranya (2019) in Madurai, the study findings revealed that was a statistically significant association between level of episiotomy wound healing and age of mothers between 20 – 25 years in the intervention group I and in the intervention group II.[37]The present study findings are analogous with the study findings of Vijayasuguna. V & Jinu K Rajan (2022) who found no association between episiotomy wound healing score and postnatal mothers socio demographic variables.[38] Tak HK & Chaturvedi D. (2021) and Kumawat A. & Kaur A. (2020) also revealed no significant association with demographic variables with their episiotomy wound healing scores.[128]

A contradictory study conducted by Pandya et al (2023) in Rajasthan, revealed a significant association between the wound healing score and selected variables of group A (Dry heat) like parity, weight of the baby, types of family and indication of episiotomy while no such association was found in group B (moist heat) participants.[129]

Limitations of the study

- Throughout the data collection phase, the researcher made extra efforts to obtain data included night shifts.
- Since it is a new procedure for most of the postnatal mothers, the researcher found it difficult in making them understand the merits of the procedure.
- More privacy was needed to perform the procedure.

Implications of the study

The findings of the study have certain important implications for thenursing services, education, administration, and nursing research.

Nursing services

- Nurses can act as an educator, leader, supervisor, protector, advocator and team member in various situation of work. Dry heat and moist heat can be given to the postnatalmothers on episiotomy wound to protect from pain and inflammation. The findings of the study will help the postnatal mothers to protect themselves from pain and inflammation for subsequent delivery.
- Nurse midwifery practitioners can incorporate this warm compression and infra- red lamp therapy into standard episiotomy wound healing management for postnatal mothers.
- Nurses can act as a change agent in introducing the various preventive measures to prevent infection and to reduce pain among the postnatal mothers with episiotomy.

Nursing education

- The result of the study will help the nurse educators to incorporate the knowledge regarding dry heat and moist heat on episiotomy wound healing and pain.
- The study emphasizes on the need of educating the nursing personnels, non- nursing personal and the general public through in service ,workshops or continuing education program to update their knowledge and skills in educating the mothers regarding regarding the application of dry heat and moist heat.
- The nurse educator can include information on infra red rays and warm compression in the clinical rounds and clinical presentation.

Nursing research

- The study can be a baseline for further studies to build upon. Nurse researchers can explore more nursing interventions regarding episiotomy wound healing those which are more convenient ,easily acceptable by postnatal mothers and are cost-effective.
- The nurse administrator can enable the other nurses to update their knowledge regarding the latest innovations in research.

Nursing administration

- The findings of the present study will help the nurse to organize and plan for educational programme by using various teaching methods and audiovisual aids.
- The nurse administrators can recommend to incorporate the use of infrared lamp therapy and warm compression in the post natal ward. So that the nurses can provide routinely warm compression and infrared lamp therapy to improve episiotomy wound.
- Nurse administrators can assume the responsibility by creating awareness among the postnatal mothers regarding the effectiveness of infra red rays and warm compression by facilitating free distribution of pamphlet to the postnatal mothers.

Conclusion

The main objective of the study was to compare the effectiveness of dry heat vs moist heat application on episiotomy wound healing and pain perception among the postnatal mothers at tertiary care hospitals of Bhopal. The statistical analysis revealed that there even though both dry heat and moist heat were found to be effective but dry heat was significantly more effective in reducing the pain perception and improving the wound healing status of the postnatal mothers. No significant association was found between the episiotomy wound healing and pain perception with their socio-demographic and clinical variables.

Recommendations

- A similar study can be done on large sample size to generalize the effectiveness of dry heat and moist heat on episiotomy wound healing and pain perception.
- A comparative study can also be done to assess the effectiveness of various alternative therapies for episiotomy wound healing.
- The nurse can undertake a comparative study can also be done among primi mothers and multi mothers in the postnatal wards.
- A similar study can be conducted regarding the utilization, barriers , acceptability and feasibility of the non-pharmacological therapies in the management episiotomy wound healing and pain.
- A qualitative study can be conducted comparing the experiences of the postnatal mothers regarding episiotomy pain perception and wound healing.

Summary of the chapter

This chapter discussed the findings of the study in relation to other studies. The studies conducted by other researchers also revealed similar and contradictory findings of the present study.This chapter also dealt with the limitations of the study, implication of the study, conclusion of the study and recommendation for future studies.

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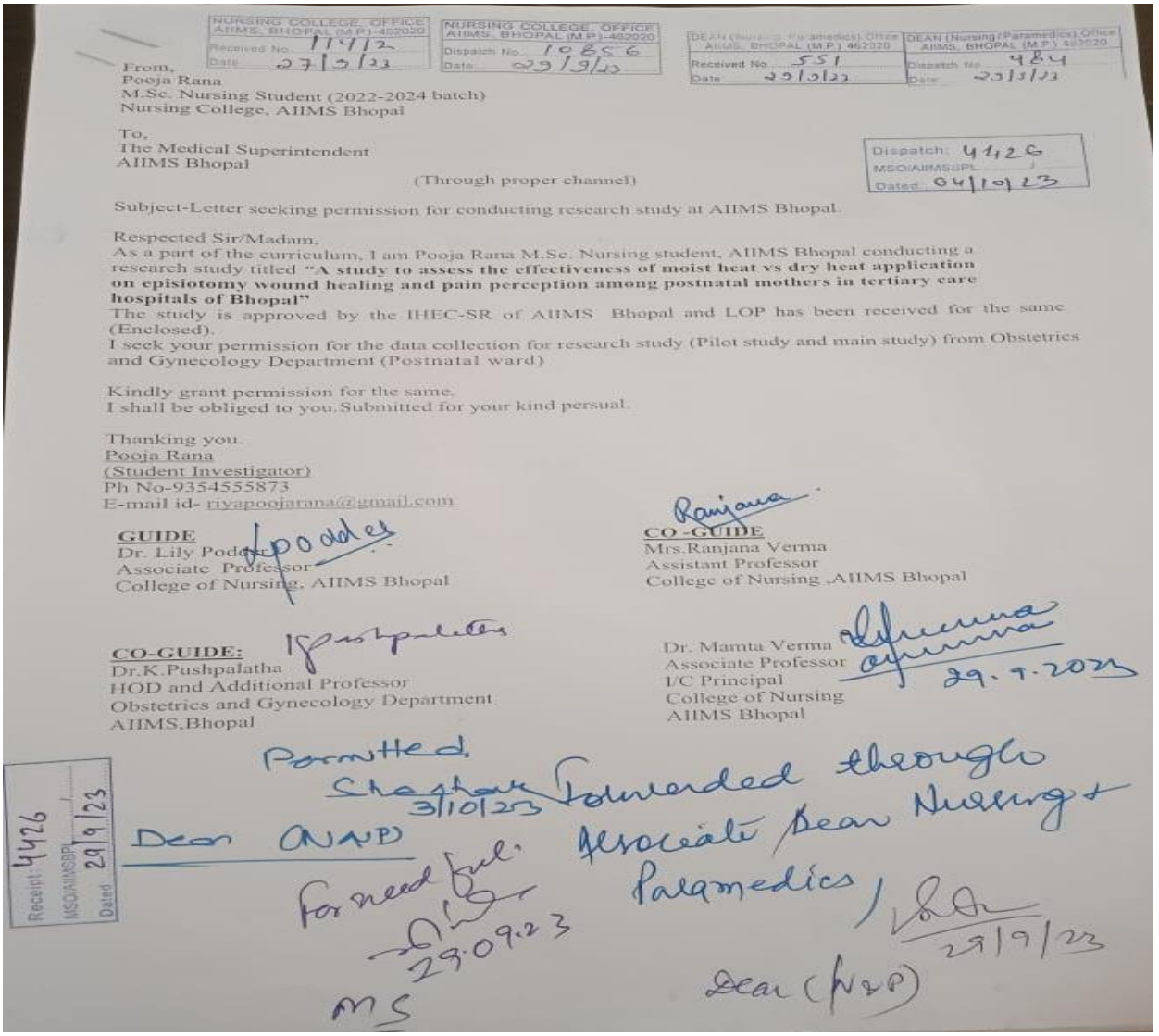
ANNEXURE 1

LETTER SEEKING PERMISSION FOR CONDUCTING PILOT STUDY



NURSING COLLEGE, OFFICE AIIMS, BHOPAL (M.P.)-462020 Received No. 1142 Date 27/9/23

NURSING COLLEGE, OFFICE AIIMS, BHOPAL (M.P.)-462020 Dispatch No. 1985 6 Date 29/9/23

DEAN (Nursing / Paramedics) Office AIIMS, BHOPAL (M.P.) 462020 Received No. 551 Date 29/9/23

DEAN (Nursing / Paramedics) Office AIIMS, BHOPAL (M.P.) 462020 Dispatch No. 484 Date 29/9/23

From,
Pooja Rana
M.Sc. Nursing Student (2022-2024 batch)
Nursing College, AIIMS Bhopal

To,
The Medical Superintendent
AIIMS Bhopal

(Through proper channel)

Dispatch: 4426 MSO/AIIMS/BPL Dated: 04/10/23

Subject-Letter seeking permission for conducting research study at AIIMS Bhopal.

Respected Sir/Madam,
As a part of the curriculum, I am Pooja Rana M.Sc. Nursing student, AIIMS Bhopal conducting a research study titled **"A study to assess the effectiveness of moist heat vs dry heat application on episiotomy wound healing and pain perception among postnatal mothers in tertiary care hospitals of Bhopal"**
The study is approved by the IHEC-SR of AIIMS Bhopal and LOP has been received for the same (Enclosed).
I seek your permission for the data collection for research study (Pilot study and main study) from Obstetrics and Gynecology Department (Postnatal ward)

Kindly grant permission for the same.
I shall be obliged to you. Submitted for your kind persual.

Thanking you.
Pooja Rana
(Student Investigator)
Ph No-9354555873
E-mail id- riyapoojarana@gmail.com

GUIDE
Dr. Lily Podder
Associate Professor
College of Nursing, AIIMS Bhopal

CO -GUIDE
Mrs.Ranjana Verma
Assistant Professor
College of Nursing ,AIIMS Bhopal

CO-GUIDE:
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Dr. Mamta Verma
Associate Professor
I/C Principal
College of Nursing
AIIMS Bhopal
29.9.2023

Receipt: 4426 MSO/AIIMS/BPL Dated 29/9/23

Permitted.
3/10/23
Dean (N&P)

Forwarded through Associate Dean Nursing & Paramedics
29.09.23
MS

29/9/23
Dean (N&P)

ANNEXURE 2

SCREENING TOOL

1. DATE OF ASSESSMENT ……

2. AGE(in years) ……

3. Diagnosis ……

4. Are you able to understand Hindi or English? [Yes/No]

   ……

5. Date and time of delivery:

   ……

6. Type of delivery:
   ……

7. Do you have a history of any case of infected perineum or sexually transmitted diseases?

   ……

8. Do you ever had a home delivery?
   ……

9. Is the patient diagnosed with any psychological problem ? (Yes/No)

   ……..

10. Are you willing to participate in the study?
    …….

SELECTED FOR THE STUDY - [ ] YES [ ] NO

1. PATIENT NAME ……..

2. CODE NO. ……

3. PLACE OF SCREENING ……..

4. CONTACT NUMBER ……...

5. ADDRESS ……

ANNEXURE 3

DATA COLLECTION TOOLS (ENGLISH)

Section1: Socio-demographic data

Instructions: Kindly tick and fill in the blanks with the most appropriate answer for each item. The information provided by you will be kept confidential and only be used for research purpose.

1. Participant code number: ……

2. Age(yrs)

(a) 15-19 years
(b) 20-25 years
(c) 26-30 years
(d) >30 years

3. Education (Kuppuswamy scale)

(a)Professional
degree (b)Graduate
(c)Diploma
(d)High school
(e)Middle school
(f) Primary school
(g)Illiterate

4. Occupation (Kuppuswamy scale)

(a)Professional
(b)Semi-professional
(c)Clerical/shop/farm
er
(d)Skilled worker
(e)Semi -skilled worker
(f)Unskilled worker
(g)Unemployed

5.Dietary pattern

(a)Vegetarian

(b)Non-vegetarian

6.Type of family

(a) Nuclear
(b) Joint
(c) (c)Extended family

S e c t i o n 2 : Clinical sheet for assessment of clinical variables

1.Body mass index
(a) <18.5
(b) 18.5-24.9
(c) 25-29
(d) 30.0-34.9

2..Parity
(a)Primi
(b)Multi

3.Did women receive any specific type of

perineal exercise.?

(a)Yes
(b)No

4..Is the woman currently receiving any
analgesic drug?
(a)Yes
(b)No

5.History of present illness

(a) Diabetes mellitus
(b) Hypertension
(c) Bronchial asthma
(d)Normal condition

5.Birth weight of baby

(a) Below 2..5kg
(b) 2.5-3.5kg
(c) Above 3.0kg

6.Type of episiotomy- Medio-lateral

(a) Right
(b) Left

ANNEXURE 4

DATA COLLECTION TOOLS (HINDI)

धारा 1: सामाजीक-जनसांख्यकी डेटा

<u>निर्देश</u> : कृपया प्रत्येक आइटम के लिए सबसे उपयुक्त उत्तर के साथ रिक्त स्थान पर निशान लगाएं और भरें। आपके द्वारा प्रदान की गई जानकारी गोपनीय रखी जाएगी और केवल शोध उद्देश्य के लिए उपयोग की जाएगी।

1.प्रितभागी कोड संख्या: ……

2. आयु (वर्ष)

(ए) 15-19 वर्ष
(बी) 20-25 वर्ष
(सी) 26-30 वर्ष
(डी) >30 वर्ष

3. शिक्षा (कुप्पुस्वामी स्केल)

(ए) व्यावसायिक डिग्री
(बी)स्नातक (सी)डिप्लोमा
(डी) हाई स्कूल
(ई)मिडल स्कूल
(एफ)प्राथिमक स्कूल
(छ)अनपढ़

4. व्यवसाय (कुप्पुस्वामी स्केल)(ए)

एक पेशेवर

(बी)अर्ध-पेशेवर
(सी) लिपक/दुकान/किसान
(डी)कुशल श्रिमक
(ई)अर्ध-कुशल श्रिमक
(च)अकुशल श्रिमक
(छ)बेरोजगार

5. आहार पैटर्न

(शाकाहारी
(बी)मांसाहारी

6. पिरवार का प्रकार

(ए) परमाणु
(बी) संयुक्त
(सी)विस्तारीत पिरवार

खंड 2: नैदानिक चर के मूल्यांकन के लिए नैदानिक शीट

1. बॉडी मास इंडेक्स
(ए) <18.5
(बी)18.5-24.9
(सी) 25-29
(डी) 30.0-34.9

2. .समता
(ए)प्राइमी
(बी)बहु

3. क्या मिहलाओं को कोई विशष्ट प्रकार का पेरिनयल व्यायामप्राप्त हुआ?

(ए)हाँ
(बी)नहीं

4. क्या मिहला को वर्तमान में कोई एनाल्जेसिक दवा मिल रही है?
(ए)हाँ
(बी)नहीं

5. वर्तमान बीमारी का इितहास(ए)

मधुमेह मेलिटास
(बी) उच्च रक्तचाप
(सी)ब्रोन्कियल
अस्थमा
(डी) सामान्यस्थित

6. जन्म के समय शिशु का वजन

(ए) 2.5 किग्रा से
कम(बी) 2.5-3.5
किग्रा
(सी) 3.5 किग्रा से
ऊपर

7. एपीसीओटॉमी का प्रकार- मेडियो-लेटरल
(ए) सही है
(बी) वाम

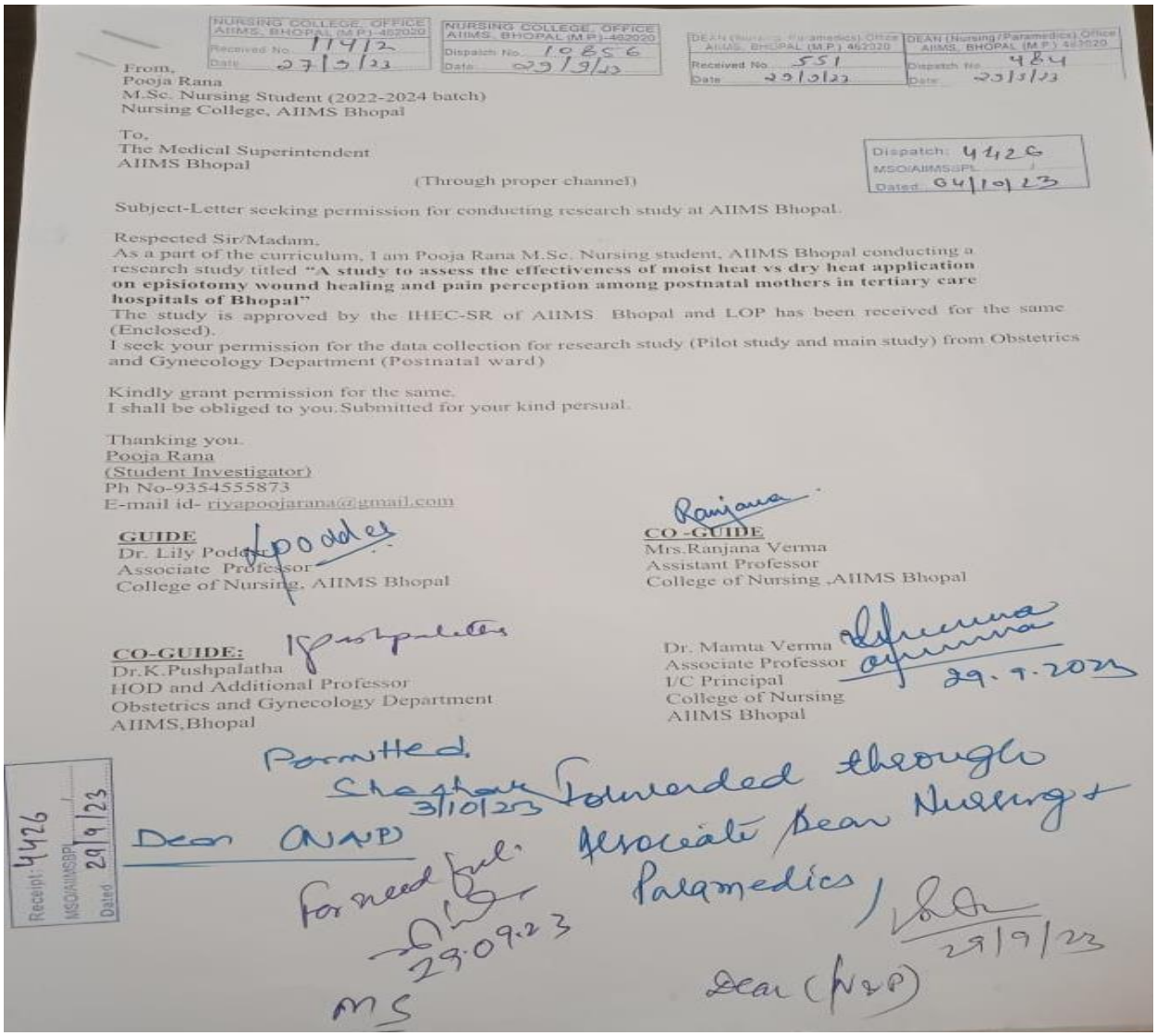
ANNEXURE 5

LIST OF EXPERTS (TOOL AND INTERVENTION VALIDATION)

S.No.	NAME OF EXPERTS	INSTITUTION	DESIGNATION
1.	Mrs.Naseema Shafqat	AIIMS Bhopal	Assistant Professor
2.	Mrs. Anju Verma	CON, SGPGIMS	Associate Professor
3.	Dr. Arun Kr. Dora	AIIMS Bhopal	Associate Professor
4.	Dr. Seema Rani Chopra	GCON, Surat	Associate Professor
5.	Dr. Prasuna Jelly	AIIMS, RISHIKESH	Associate Professor
6.	Mr. Himanshu Vyas	AIIMS, Jodhpur	Associate Professor
7.	Mrs. Geeta Bhardwaj	AIIMS Bhopal	Assistant Professor
8.	Mrs. Niza Subramaniyam	CON, BHU	Assistant professor
9.	Mrs. Anitha Moncy	CON, BHU	Assistant Professor
10	Dr.Ajay Halder	AIIMS Bhopal	Associate Professor
11	Dr.Jyoti Nath Modi	AIIMS Bhopal	Associate Professor
12	Dr. Shweta Patel	AIIMS Bhopal	Assistant Professor
13	Dr.Bharti Singh	AIIMS Bhopal	Assistant Professor

ANNEXURE 6

LETTER REQUESTING EXPERTS OPINION AND SUGGESTIONS FORTHE CONTENT VALIDITY



NURSING COLLEGE, OFFICE AIIMS, BHOPAL (M.P.)-462020
Received No. 1141 2
Date 27/9/23

NURSING COLLEGE, OFFICE AIIMS, BHOPAL (M.P.)-462020
Dispatch No. 1085 6
Date 29/9/23

DEAN (Nursing/Paramedics) Office AIIMS, BHOPAL (M.P.) 462020
Received No. 551
Date 29/9/23

DEAN (Nursing/Paramedics) Office AIIMS, BHOPAL (M.P.) 462020
Dispatch No. 484
Date 29/9/23

From,
Pooja Rana
M.Sc. Nursing Student (2022-2024 batch)
Nursing College, AIIMS Bhopal

To,
The Medical Superintendent
AIIMS Bhopal
(Through proper channel)

Dispatch: 4126
MSO/AIIMS/BPL
Dated 04/10/23

Subject-Letter seeking permission for conducting research study at AIIMS Bhopal.

Respected Sir/Madam,
As a part of the curriculum, I am Pooja Rana M.Sc. Nursing student, AIIMS Bhopal conducting a research study titled **"A study to assess the effectiveness of moist heat vs dry heat application on episiotomy wound healing and pain perception among postnatal mothers in tertiary care hospitals of Bhopal"**
The study is approved by the IHEC-SR of AIIMS Bhopal and LOP has been received for the same (Enclosed).
I seek your permission for the data collection for research study (Pilot study and main study) from Obstetrics and Gynecology Department (Postnatal ward)

Kindly grant permission for the same.
I shall be obliged to you.Submitted for your kind persual.

Thanking you.
Pooja Rana
(Student Investigator)
Ph No-9354555873
E-mail id- riyapoojarana@gmail.com

GUIDE
Dr. Lily Poddar
Associate Professor
College of Nursing, AIIMS Bhopal

CO -GUIDE
Mrs.Ranjana Verma
Assistant Professor
College of Nursing ,AIIMS Bhopal

CO-GUIDE:
Dr.K.Pushpalatha
HOD and Additional Professor
Obstetrics and Gynecology Department
AIIMS,Bhopal

Dr. Mamta Verma
Associate Professor
I/C Principal
College of Nursing
AIIMS Bhopal
29.9.2023

Permitted.
Forwarded through
Dean (N&P)
3/10/23
Associate Dean Nursing & Paramedics
29/9/23
Dean (N&P)
For need full
29.09.23
MS

Receipt: 4126
MSO/AIIMSBPL
Dated 29/9/23

ANNEXURE 7

CRITERIA CHECKLIST FOR THE VALIDATION OF THE TOOL

Tool 1: Socio-demographic data

The tool contains 5 items regarding sociodemographic data. We need your expert judgement on degree of relevancy of each item to the measured domains. If there are any suggestions, please mention in the remark column.

S.No	Item number	Highly relevant 4	Quite relevant 3	Somewhat relevant 2	Not relevant 1	Remarks
1.						
2.						
3.						
4.						
5.						

Tool 2: Clinical sheet for assessment of clinical variables

The tool contains 7 items regarding sociodemographic data. We need your expert judgement on degree of relevancy of each item to the measured domains. If there are any suggestions, please mention in the remark column.

S.No	Item number	Highly relevant 4	Quite relevant 3	Somewhat relevant 2	Not relevant 1	Remarks
1.						
2.						
3.						
4.						
5.						
6.						
7.						

ANNEXURE 8

CONTENT VALIDITY CERTIFICATE (TOOL)

Certificate of validation

This is to certify that the tool prepared by Pooja Rana, M.Sc. Nursing 2022 batch student, Nursing college, AIIMS Bhopal, to be used in her study titled **"A study to assess the effectiveness of moist heat vs dry heat application on episiotomy wound healing and pain perception among postnatal mothers in tertiary care hospitals of Bhopal"** has been validated by me and is found to be **valid/ not valid.**

Overall Remark-

Signature:

Name of the expert:

Designation:

Name of the Institution:

Official seal:

Date:

Place :

ANNEXURE-9

CERTIFICATE OF LANGUAGE TRANSLATION

CERTIFICATE OF TRANSLATION

TO WHOM IT MAY CONCERN

This is to certify that Ms.Pooja Rana (Batch 2022-2024) M.Sc. Obstetrics and Gynecological Nursing student of Nursing College, AIIMS Bhopal is conducting research on topic "A study to assess the effectiveness of moist heat vs dry heat application on episiotomy wound healing and pain perception among postnatal mothers in tertiary care hospitals of Bhopal"

The Hindi version of Participant Information Sheet, Participant Informed ConsentForm, Screening Tool , Sociodemographic data sheet and clinical data sheet content for this study is a true and accurate translation of the English version and is valid to collect data for research.

The Secondary School Dist. Dahod Gujarat

Seal & Signature: .....

Name of the language expert: Rani Jashvantbhai Ranchhodbhai

Qualification: M.A. B.Ed.

Designation: A.T. Teacher

Name of the institute: The secondary school chhapariyad. Ta-Singvad. Di-Dahod Gujarat.

Date: 30-05-2023

Place: chhapariyad.

ANNEXURE 10

PARTICIPANT INFORMATION SHEET-ENGLISH

Title of the study: "A study to assess the effectiveness of moist heat vs dry heat application on episiotomywound healing and pain perception among postnatal mothers in tertiary care hospitals of Bhopal."

Principal Investigators : Ms.Pooja Rana, Obstetrics and Gynecological ,College, AIIMS Bhopal

Guidance : Dr.Lily Podder, Associate professor, college, AIIMS Bhopal Mrs.Ranjana Verma, Assistant professor, AIIMS Bhopal (Co-Guide)Dr.K.Pushpalatha,HOD and additional professor ,department of obstetrics and gynecology ,AIIMS Bhopal (Co-Guide)

Introduction: Iam conducting a research study to evaluate the effectiveness of moist heat vs dry heat application on episiotomy wound healing and pain perception among postnatal mothers in tertiary care hospitals of Bhopal in AIIMS Bhopal. We would like to have your participation for conduction of the study. If you agree to take part voluntarily, we will ask you to sign a consent form .

Purpose of the study : The study is aimed to compare the effect of moist heat vs dry heat application on episiotomy wound healing and pain perception among postnatal mothers

Should I participate? Participation in this research is completely voluntary.

a) **What is expected of me if I join? After screening the patient informed consent will be obtained from patient , there will be allocation of participants in the experimental groups. Self structured questionnaire will be administered for collection of sociodemographic data & clinical data. Pre and post-interventional assessment will be done along with intervention to evaluate the effectiveness of the intervention.**

b) **How long will my participation in the study last? The duration of the participation may last 3days (20 minutes and 2 times day)by the investigator.**

c) **Do I have to come separately for this study or will additional tests be necessary? No.**

d) **What are the potential benefits of joining? Taking part will help gain knowledge about how to take care of episiotomy wound site and the intervention will result in improvement and management of episiotomy wound healing and pain perception .**

e) **Potential loss and risk from participating in it. There is no harm or risk due to participation in this study as per the evidence from previous studies, although slight irritation can persist for some time after the intervention. There will be provision for hospital stay in case of any major adverse events as per the policy.**

f) **What will happen to the information collected about me? All information collected will be kept strictly confidential**

g) **What happens if I change my mind about participating in this study? You have the right to change your views at anytime during the course of study without any damages or penalties**

6. **Whom should I contact for more information regarding this or if I have any question/doubts in my mind later?If you want any information you can contact:**

- **Dr. Shashank Purwar, Member Secretary, Institution Human Ethics Committee.Contact details: phone - 7773010099 and email -ihecpgr@aiimsbhopal.edu.in**
- **Dr. Mamta Verma, Principal Nursing College, AIIMS Bhopal.**

h) **Contact details: phone- +919981540519, Email- principal.nursing@aiimsbhopal.edu.in**

ANNEXURE 11

PARTICIPANT INFORMATION SHEET-HINDI

प्रतभागी सूचना पत्र

1. **अध्ययन का शीर्षक:** "भोपाल के तृतीयक देखभाल अस्पतालों में सिवोत्तर माताओं के बीच एपीसीओटोमी घाव भरने और दद की र्ारणा पर नम गमी बनामसूखी गमी अनुियोग की िभावशीलता का आकलन करने के प्र लए एक अध्ययन।"

2. **प्रधान अन्वेर्क**:सुिी पूजा राणा, िसू॰ त एवं स्त्री रोग, नर्॰ संग कॉलेज, एम्स भोपाल

3. **मागदशन**:डॉ. ॰ लली पोद्दार, एसो॰ सएट िोफे सर, नर्॰ संग कॉलेज, एम्स भोपाल िीमती रंजना वमा, सहायक िोफे सर, एम्स भोपाल (सह-मागदशक) डॉ.के. पुष्पलता, एचओडी और॰अतरक्त िोफे सर, िसू॰ त एवं स्त्री रोग॰ वभाग, एम्स भोपाल (सह-मागदशक))

4. **परचय:**मैं एम्स भोपाल के तृतीयक देखभाल अस्पतालों में सिवोत्तर माताओं के बीच एपीसीओटॉमी घाव भरने और दद की र्ारणा पर नम गमी बनामशुष्क गमी अनुियोग की िभावशीलता का मूल्ांकन करने के प्र लए एक शोर् अध्ययन कर रहा हं।
हम अध्ययन के संचालन के॰ लए आपकी भागीदारी चाहेंगे। ॰यद आप स्वेच्छा से भाग लेने के॰ लए सहमत हैं, तो हम आपसे एक सह॰मत िपत्र पर हस्ताक्षरकरने के॰ लए कहेंगे

5.**इस अध्ययन का उद्देश्य :**अध्ययन का उद्देश्य िसवोत्तर माताओं के बीच एपीसीओटॉमी घाव भरने और दद की र्ारणा पर नम गमी बनाम सूखीगमी के िभाव की तुलना करना है।

क्या मुझे भाग लेना चाप्र हए?इस शोर्॰ में भागीदारी पूणत स्वै च्॰ छक है।

क) प्रद मैं शाप्र मल होता हं तो मुझसे क्या अपेक्षा की जाती है?रोगी की स्त्री॰ नंग के बाद रोगी से सू॰ चत सह॰मत िाप्त की जाएगी, िियोगात्मक समूहों में ॰ितभा॰ गयों का आवंटन ॰ कया जाएगा। सामा॰ जक-जनसांख्॰ यकीय डेटा और नैदा॰ नकडेटा के संग्रह के॰ लए स्व-संरचत िश्नावली का संचालन ॰ कया जाएगा। हस्तक्षेप की िभावशीलता का मूल्ांकन करने के॰ लए हस्तक्षेप के सा-सा पूव औरबाद का मूल्ांकन भी॰ कया जाएगा।

ख) अध्ययन में मेरी भागीदारी प्र कतने समय तक रहेगी?अन्वेर्क द्वारा भागीदारी की अव॰ध 3॰ दन (20॰ मनट और प्र दन में 2 बार) तक रह सकतीहै।

ग) क्या मुझे इस अध्ययन के प्र लए अलग से आना होगा या प्रअप्रतरक्त परीक्षण आवश्यक होगे?नही।

घ) शाप्र मल होने के संभाप्र वत लाभ क्या हैं?भाग लेने से एपीसीओटॉमी घाव स्ल की देखभाल करनेके तरीके केबारे में ज्ञान िाप्त करने में मदद॰ मलेगी और हस्तक्षेप के ॰परणामस्वर ूप एपीसीओटॉमी घाव भरने और दद की र्ारणा में सुर्ार और िबंर्न होगा।

ई) इसमें भाग लेने से संभाप्र वत हाप्र न और जोप्र खम।॰ पछले अध्ययनों के साक्ष्य के अनुसार इस अध्ययन में भाग लेने से कोई नुकसान या जो॰ खमनहीं है, हालां॰ क हस्तक्षेप के बाद कु छ समय तक िोडी जलन बनी रह सकती है। नी॰ त के अनुसार ॰ कसी भी बडी ॰ितकू ल घटना के मामले में अस्पताल में रहने का िावर्ान होगा।

च) मेरे बारे में एकत्र॰ रत की गई जानकारी का क्या होगा?एकत्र॰ रत की गई सभी जानकारी पूणतया गोपनीय रखी जाएगी

छ) प्रद मैं इस अध्ययन में भाग लेने के बारे में अपना मन बदल दूं तो क्या होगा?आपको अध्ययन के दौरान॰ कसी भी समय॰ बना॰ कसीनुकसान या दं ड के अपने॰ वचार बदलने का॰अर्कार है

6. इस संबंर् में॰अर्क जानकारी के॰ लए या बाद में मेरे मन में कोई िश्न/संदे ह हो तो

मुझे॰ कससे संपक करना चा॰ हए? ॰यद आपको कोई जानकारी चा॰ हए तो आप संपक कर सकते

हैं:

- डॉ. शशांक पुरवार, सदस्य॰सचव, इं स्टीट्यूशन ह्यूमन ॰एिक्स कमेटी। संपक ॰ ववरण: फोन - 7773010099 और ईमेल -

ihecpgr@aiimsbhopal.edu.in

- डॉ. ममता वमा, प्र रं सपल नर् स ंग क ॉलेज, एम्स भोपाल।
  सं पक वववरण: फोन- +919981540519 , ईमेल- प्र रं सपल.नर् स ंग@aiimsbhopal.edu.in

ANNEXURE 12

PARTICIPANT INFORMED CONSENT FORM (PICF) (English)

Participant Identification Number for this Study: ……
Title of Project: A study to assess the effectiveness of moist heat vs dry heat application on episiotomywound healing and pain perception among postnatal mothers in tertiary care hospitals of Bhopal

Name of Student Investigator:Ms.Pooja Rana Tel No.(s): 9555723254
Name of Thesis Guide: Dr. Lily Podder
The contents of the information sheet version II dated 20 August 2023 that was provided have been read carefullyby me / explained in detail to me, in a language that I comprehend, and I have fully understood the contents. I confirm that I have had the opportunity to ask questions.
The nature and purpose of the study and its potential risks/benefits and expected duration of the study, and other relevant details of the study have been explained to me in detail. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal right beingaffected.
I understand that the information collected about me from my participation in this research and sections of any ofmy medical notes may be looked at by responsible individuals from AIIMS. I give permission for this individualto have access to my records.
If participants is child, his/her verbal of written assent has been obtained.I agree to take part in the above study.

(Signature/Left Thumb Impression)

Date…… Place …….....
Name of the participant…….....
Son/Daughter/Spouse of…….
Complete Postal Address ……...
If illiterate.
The information sheet has been read and explained to the participant and given the opportunity to ask questions.I confirm that the individual has given consent freely.

Signature of Legally acceptable representative or impartial witness.
Date:
Name of LAR or impartial witness:
Address:
This is to certify that the above consent has been obtained in my presence.

Signature of the student Investigator Date ……

…

Place……

ANNEXURE 13

MASTER DATA SHEET

Patient	Code 1=dry heat 2=moist heat	Age	Education	Occupation	Dietary pattern	Type of family	Body mass index	Gravida	Any perineal exercise?	Receiving any analgesic	History of present illness	Birth weight of baby	Type of episiotmy	Length of episiotomy	Pre test_pain	Pre test_wound healing	Post test_pain	Post test_wound healing
1	1	3	2	7	1	1	2	1	2	1	4	2	1	2	4	5	1	1
2	2	2	4	2	1	1	2	1	2	1	4	2	1	2	3	6	1	1
3	1	2	2	7	2	2	2	2	2	1	4	3	1	2	4	6	1	1
4	2	2	6	7	1	1	3	1	2	1	4	2	1	2	6	6	2	2
5	1	2	4	7	1	2	2	1	1	1	1	2	1	2	5	7	2	2
6	2	2	2	3	2	1	3	2	2	1	4	1	1	2	5	5	2	1
7	1	3	2	7	1	1	2	1	2	1	4	2	1	2	6	7	2	2
8	2	2	4	7	1	1	2	1	2	1	4	2	1	2	6	5	4	2
9	1	2	4	7	2	3	2	2	2	1	2	3	1	2	6	6	2	3
10	2	3	1	2	1	1	3	1	2	1	4	2	1	2	6	6	3	3
11	1	2	4	7	1	2	2	1	1	1	4	2	1	2	6	6	3	2
12	2	2	1	7	2	1	3	2	2	1	4	2	1	2	5	7	2	5
13	1	3	2	4	1	1	3	1	2	1	4	2	1	2	5	5	1	2
14	2	2	4	7	2	1	2	1	2	1	4	3	1	2	5	7	1	2
15	1	2	2	7	1	2	2	2	2	1	4	2	1	2	5	5	2	2
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17	1	2	4	7	2	2	3	1	2	1	4	1	1	2	5	6	2	2
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19	1	2	2	7	1	1	3	1	2	1	4	2	1	2	5	7	2	3
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26	2	2	7	7	1	1	2	1	2	1	1	1	1	2	5	7	2	3
27	1	2	2	7	1	2	2	2	2	1	4	2	1	2	6	5	3	3
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30	2	2	2	7	1	1	2	2	2	1	4	2	1	2	6	5	2	2
31	1	2	6	7	2	2	3	1	2	1	4	2	1	2	5	7	2	3
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34	2	2	2	1	1	1	2	1	2	1	4	2	1	2	5	6	2	3
35	2	2	4	7	1	1	2	1	2	1	4	2	1	2	6	6	3	2
36	1	3	2	7	2	1	3	2	2	1	2	2	1	2	5	7	2	3
37	2	2	2	7	1	2	3	1	2	1	4	1	1	2	5	5	2	3
38	1	2	4	7	1	1	2	1	2	1	4	2	1	2	6	7	2	3
39	2	2	7	7	2	2	1	2	2	1	4	2	1	2	5	6	2	2
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45	2	2	2	4	1	3	2	2	1	1	4	2	1	2	6	7	2	4
46	1	2	6	7	1	1	3	1	2	1	4	3	1	2	4	5	1	3

47	2	3	4	7	2	1	2	1	2	1	4	2	1	2	6	6	3	3
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49	1	2	2	7	1	2	4	1	2	1	1	1	1	2	5	6	3	2
50	2	2	4	7	2	1	3	1	2	1	4	2	1	2	4	7	1	3
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52	2	2	7	7	2	1	3	1	2	1	4	3	1	2	4	5	1	3
53	1	2	4	7	1	1	4	1	2	1	4	2	1	2	6	7	2	3
54	2	2	2	7	1	1	2	2	2	1	4	2	1	2	4	7	1	3
55	1	3	2	3	2	2	2	1	2	1	1	2	1	2	6	5	3	2
56	2	2	4	7	1	1	3	1	2	1	4	2	1	2	6	7	2	4
57	1	2	2	7	1	2	4	2	2	1	4	2	1	2	5	5	3	3
58	2	2	7	7	2	1	3	1	2	1	4	2	1	2	5	6	2	3
59	1	2	6	3	1	3	2	1	2	1	4	2	1	2	4	6	1	2
60	2	2	4	1	1	1	2	2	2	1	4	3	1	2	4	6	1	3

ANNEXURE 14

CALIBRATION CERTIFICATE FOR INRARED LAMP

ISO/IEC 9001:2015
ISO/IEC 17025:2017
(ACCREDITED LABORATORY)

Hi-Tech Laboratory & Services
(A House of Measurement & Calibration)

Shivani Complex, C-4, Vidya Vihar, Opp. Barkatullah University, Bhopal- 462 026 M.P., India
Tel.: 0755 - 2410094, 4235738 Telefax. : 0755 - 2410094
Mobile: 094250 09513 web: www.htls.co.in
e-mail: htlsbpl@hotmail.com / info@htls.co.in

"TEST CERTIFICATE "

Mechanical Testing			Certificate Issue Date:	29.09.2023
Certificate No	Received On	Received Condition	Tested On	Page No
HTLS/23/PR/882 02	27.09.2023	Working	28.09.2023	1 of 1

1)a. Calibrated for:
Miss Pooja Rana ,
Room No-608 , PG Transit Hostel ,
AIIMS , Saket Nagar
Bhopal - 462020 (M. P)

b. Name of Equipment /Instrument :
Infrared Lamp
UV Light (Temp. & Lux)

c. Calibration Location: At Lab

2) Description & Identification of Equipments / Instruments Under Calibrations (EUC*):

Make	Capacity	Serial No.	Identification No.
Micro Max.	-	—	MSH1001953

Material	Calibrated Purpose
SS	To Determine the Temperature & illuminance distance at 60 Cm & 70 Cm

3) Standards/ Calibrator & Measuring Equipments Used :

Standards Used	Make / I.D.No.	Traceability Certificate No.	Calibrated By	Validity
High Precision Digital Thermometer With RTD (PT - 100)	Yudian & AI-5600 / HTLS/DT/01	TL/022/1215.1.1	NABL : CC2840	04.11.2023
Digital Lux Meter	Lutron LX 1102 / HTLS/LM/01	QSI/0435/23/03	NABL : CC2717	02.03.2024
Measuring Tape	Freemans / HTLS/MT/02	SE.23.01.0691	NABL : CC2113	29.01.2024

The Standards used for calibration were calibrated by using reference standard traceable to National Standard .

4) Principle /Methodology of Calibration & Procedure :
Methodology adopted for Calibration is as per HTLS Procedure NO.HTLS/CP/TH-01 & LM-01

5) Calibration Results: OBSERVATION

Sl. No.	Distance Form Lamp.	Time	Measured Standard Temp. (Average) in °C	Measured Standard Lux. (Average) in Lux
a.	60 Cm.	1 min	31.7	772
b.		2 min	32.5	770
c.		3 min	33.4	776
d.		4 min	33.7	779
e.		5 min	33.9	780
a.	70 Cm.	1 min	30.8	748
b.		2 min	32.2	745
c.		3 min	31.4	742
d.		4 min	31.6	745
e.		5 min	31.9	746

The values have been rounded off as per IS:2-1960(wherever applicable).

6) Environmental Condition(s): a) Temperature: 25±2°C b) Humidity: 50±10%

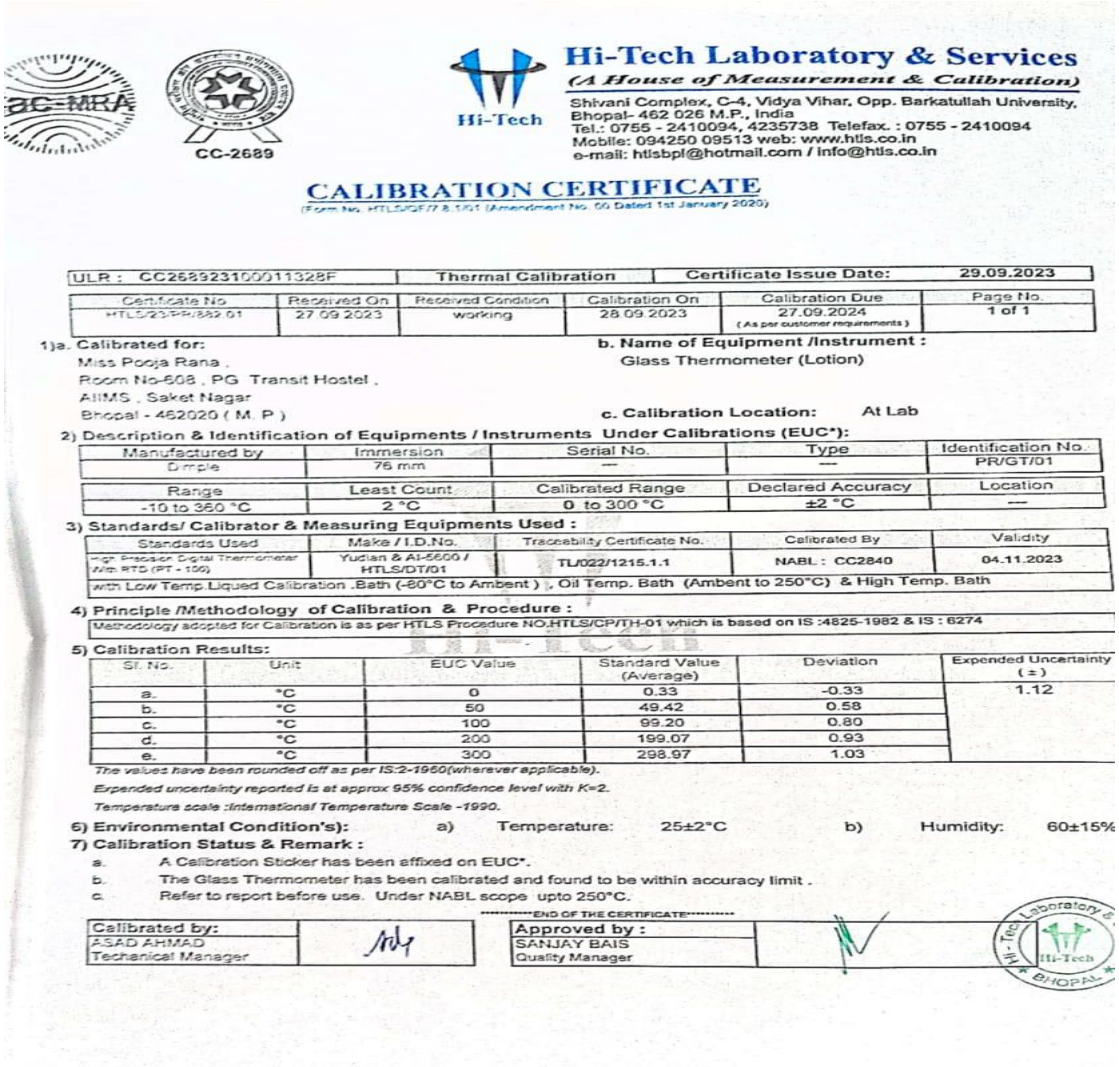
7) Calibration Status & Remark :
a. A Calibration Sticker has been affixed on EUC*.
b. The Infrared Lamp has been Tested and status report has been given.
c. Refer to report before use.

**********END OF THE CERTIFICATE**********

Calibrated by:		Approved by :	
SANJAY BARPETE		SANJAY BAIS	
Calibration Engineer		Quality Manager	

Hi-Tech Laboratory & Hi-Tech BHOPAL

CALIBRATION CERTIFICATE FOR LOTION THERMOMETER



CC-2689

Hi-Tech Laboratory & Services

(A House of Measurement & Calibration)

Shivani Complex, C-4, Vidya Vihar, Opp. Barkatullah University,
Bhopal- 462 026 M.P., India
Tel.: 0755 - 2410094, 4235738 Telefax. : 0755 - 2410094
Mobile: 094250 09513 web: www.htls.co.in
e-mail: htlsbpl@hotmail.com / info@htls.co.in

CALIBRATION CERTIFICATE

(Form No. HTLS/QF/7.8.1/01 (Amendment No. 00 Dated 1st January 2020)

ULR : CC268923100011328F	Thermal Calibration	Certificate Issue Date: 29.09.2023

Certificate No.	Received On	Received Condition	Calibration On	Calibration Due	Page No.
HTLS/23/TH/882-01	27.09.2023	working	28.09.2023	27.09.2024 (As per customer requirements)	1 of 1

1)a. **Calibrated for:**
Miss Pooja Rana ,
Room No-608 , PG Transit Hostel ,
AIIMS , Saket Nagar
Bhopal - 462020 (M. P)

b. Name of Equipment /Instrument :
Glass Thermometer (Lotion)

c. Calibration Location: At Lab

2) **Description & Identification of Equipments / Instruments Under Calibrations (EUC*):**

Manufactured by	Immersion	Serial No.	Type	Identification No.
Dimple	76 mm	---	---	PR/GT/01

Range	Least Count	Calibrated Range	Declared Accuracy	Location
-10 to 360 °C	2 °C	0 to 300 °C	±2 °C	---

3) **Standards/ Calibrator & Measuring Equipments Used :**

Standards Used	Make / I.D.No.	Traceability Certificate No.	Calibrated By	Validity
High Precision Digital Thermometer With RTD (PT - 100)	Yudian & AI-5600 / HTLS/DT/01	TL/022/1215.1.1	NABL : CC2840	04.11.2023
With Low Temp.Liqued Calibration ,Bath (-80°C to Ambient) , Oil Temp. Bath (Ambent to 250°C) & High Temp. Bath				

4) **Principle /Methodology of Calibration & Procedure :**
Methodology adopted for Calibration is as per HTLS Procedure NO.HTLS/CP/TH-01 which is based on IS :4825-1982 & IS : 6274

5) **Calibration Results:**

Sl. No.	Unit	EUC Value	Standard Value (Average)	Deviation	Expended Uncertainty (±)
a.	°C	0	0.33	-0.33	1.12
b.	°C	50	49.42	0.58	
c.	°C	100	99.20	0.80	
d.	°C	200	199.07	0.93	
e.	°C	300	298.97	1.03	

The values have been rounded off as per IS:2-1960(wherever applicable).
Expended uncertainty reported is at approx 95% confidence level with K=2.
Temperature scale :International Temperature Scale -1990.

6) **Environmental Condition's):** a) Temperature: 25±2°C b) Humidity: 60±15%

7) **Calibration Status & Remark :**
a. A Calibration Sticker has been affixed on EUC*.
b. The Glass Thermometer has been calibrated and found to be within accuracy limit .
c. Refer to report before use. Under NABL scope upto 250°C.

**********END OF THE CERTIFICATE**********

Calibrated by:		Approved by :	
ASAD AHMAD Technical Manager		SANJAY BAIS Quality Manager	

Hi-Tech Laboratory & Services BHOPAL